VOL. 1 MANILA, P. I., FEBRUARY, 1905 No. 9

OF CONGRESS
APR
2
1905
PERIODICAL DIV.

THE FAR-EASTERN REVIEW

ENGINEERING, COMMERCE, FINANCE.

PRICE: 25 cents, U. S. Cy.
KELLY & WALSH, Agents, Hongkong, Shanghai, Singapore and Yokohama

HOWARTH
ERSKINE,
LIMITED.

BRIDGE BUILDERS

CONSTRUCTIONAL, MECHANICAL AND ELECTRICAL ENGINEERS,
IRON AND BRASS FOUNDERS, GENERAL CONTRACTORS.

HEAD OFFICE, SINGAPORE.

CABLE ADDRESS, "ERSKINE"

BRANCHES AT

Kwala Lumpur, Selangor, F. M. S.; Ipoh, Perak, F. M. S.; Bangkok, Siam; Deli, Sumatra; and Penang, S. S.; Manila Agents, Fred Wilson & Co.

WE CARRY THE LARGEST STOCKS OF ENGINEERING, ELECTRICAL, PLANTING AND MINING SUPPLIES IN THE EAST.

QUOTATIONS SOLICITED

A GUARANTEE OF EFFICIENCY

J. G. WHITE & CO.

INCORPORATED

ENGINEERS AND CONTRACTORS

NEW YORK
43-49 EXCHANGE PLACE

J. G. WHITE & CO., LTD.
22a COLLEGE HILL
LONDON, E. C.

CONSTRUCTION OFFICE

Cable Address;
"WHITEMOTH"

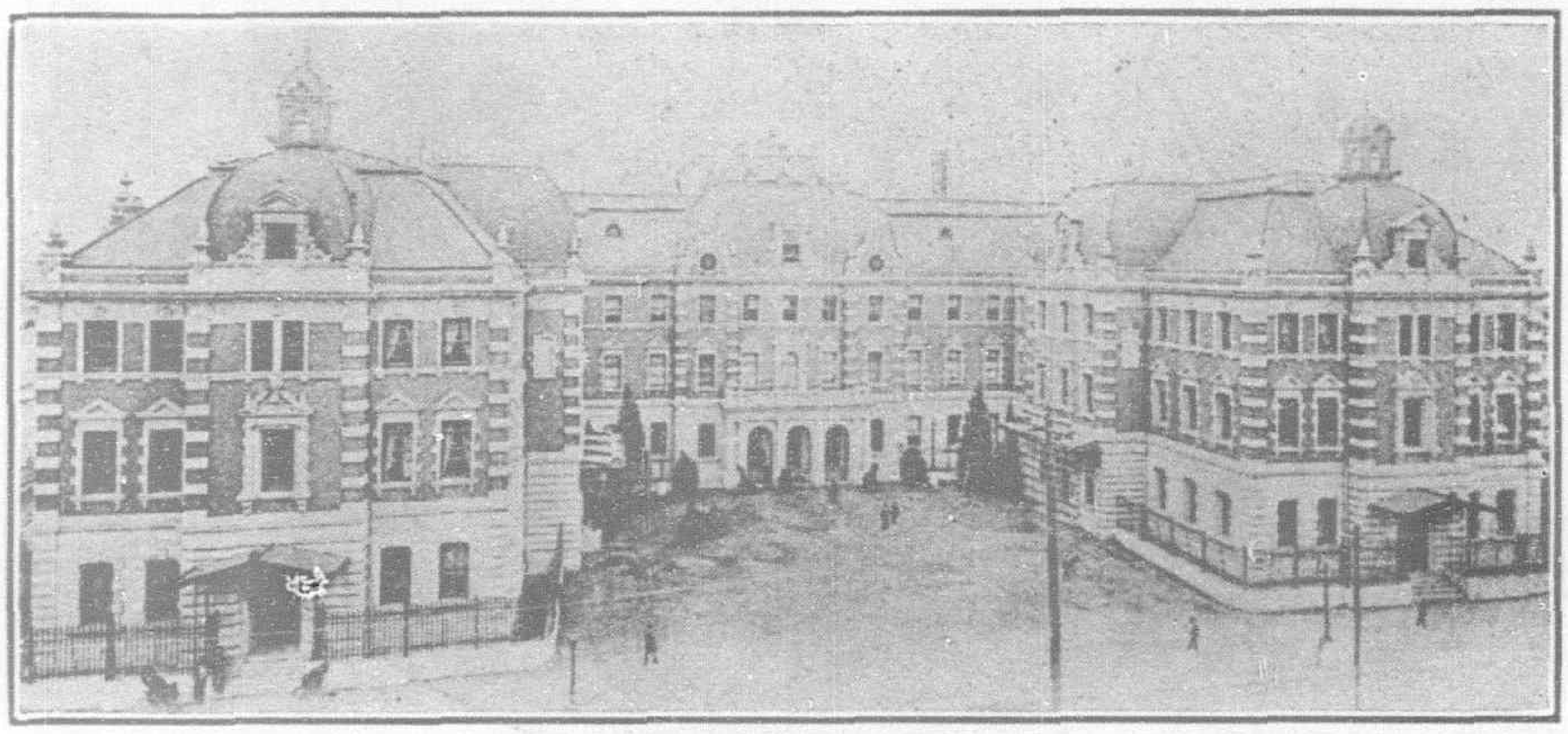
Manila, P. I.

General Telegraphic Address:
"MITSUI"

A B C 4th Edition and A1
Codes used.

THE MITSUI BUSSAN KAISHA

(Mitsui & Co. in Europe and America)



THE MITSUI BUILDING, TOKIO.
Containing the offices of the Mitsui Family Council, The Mitsui Mining Co., The Mitsui Bank, and The Mitsui Bussan Kaisha.

President: HACHIROJIRO MITSUI, Esq.
Directors: SENJIRO WATANABE, Esq. GIICHI IIDA, Esq.

HEAD OFFICE--*Surugacho, Tokio, Japan.*

BRANCHES AND REPRESENTATIVES:

Japan:—Hakodate, Karatsu, Kishima, Kobe, Kuchinotsu, Kure, Maizuru, Miike, Moji, Nagasaki, Nagoya, Osaka, Sapporo, Saseho, Taipeh, Wakamatsu, Yokohama, Yokosuka, etc.

Foreign:—Amoy, Bombay, Canton, Chefoo, Chemulpo, Hamburg, Hankow, Hongkong, London, Manila, Newchwang, New York, Port Arthur, San Francisco, Seoul, Shanghai, Singapore, Sourabaya, Sydney, Tientsin, etc.

Contractors to the Government, Army & Navy, Principal Railway Companies, and Industrial Works.

General Commission Merchants for Export of Coal, charcoal, cotton yarns, cotton cloth, raw silk, silk goods, rice, matches, camphor, copper, silver, sulphur, sleepers, cement, paper, etc., and Import of machinery, railway materials, iron, steel, tin, cotton, cotton cloth, raw sugar, flour, beans, bean cakes, kerosene oil, opium, indigo, wool, woolen cloth, etc.

Japan Sole Agents for Carnegie Steel Co., Pittsburg; John Musgrave & Sons, Bolton; Platt Bros. & Co., Oldham; Vickers, Sons and Maxim, England; General Electric Co., etc., etc., etc.

Sole Agents for Miike, Tagawa, Ida, Yamano, Hokoku, Kanada, Kishima, Mannoura, Onoura, Otsuji, Sonoda, Tsubakuro, Yoshinotani, Yoshio, Yenokibara, and other Coals.

GLAZED
STONEWARE

HOUSE
DRAIN
AND
SEWER PIPES
AND
FITTINGS
IN STOCK

GLAZED
PAVING BRICKS
AND
TILES

FIRE
BRICKS
AND
FIRE CLAY

GREEN ISLAND CEMENT CO., LTD., HONGKONG.
SHEWAN, TOMES & CO., GENERAL MANAGERS.
WORKS AT MACAO AND HONGKONG.

AGENTS:

Manila, P. I.	Wm. H. Anderson & Co.	Tientsin, Formosa, etc.	Jardine Matheson & Co.	Calcutta	Turner, Morrison & Co.
Shanghai	Shewan, Tomes & Co.	Singapore, Penang	McAlister & Co., Ltd.	Bombay	E. Spinner & Co.
Japan	Shewan, Tomes & Co.			Rangoon	Geo. Gillespie & Co.

SHEWAN, TOMES & COMPANY
IMPORT AND EXPORT MERCHANDISE, COMMISSION AGENTS
AND SHIPPING AGENTS
Canton, Kobe, Shanghai, HONGKONG and at 16 Beaver Street : : : : : New York

GENERAL MANAGERS OF

The China Light & Power Co., Ltd., Hongkong
The Green Island Cement Co., Ltd., "
The Hongkong Rope Mfg. Co., Ltd., Hongkong
The China Provident Loan & Mortgage Co., Ltd, Hongkong
The China & Manila Steamship Co., Ltd., Hongkong
The Canton Land Co., Ltd.

GENERAL AGENTS OF THE AMERICAN-ASIATIC STEAMSHIP CO., NEW YORK

AGENTS FOR

Jenkins & Co.'s "Shire" Line of Steamers
J. Marke Wood's Line of Steamers
The Yangtsze Valley Company, Ltd.
The Hongkong Tramways Electric Company, Ltd.
The American China Development Co.
The Yangtsze Insurance Association, Ltd.
World Marine Insurance Co.
Reliance Marine Insurance Co.
Union Marine Insurance Co., Ltd.
Batavia Sea and Fire Insurance Co.
North British & Mercantile Insurance Co.
Law Union & Crown Insurance Co.
Yorkshire Fire and Life Insurance Co.
Pacific Mutual Life Insurance Co. of California
Insurance Company of North America
Shanghai Pulp and Paper Co., Ltd
Canton & Hongkong Tug, Lighter & Ferry Co., Ltd.
Tacoma Grain Co.

E. C. McCullough & Co.

INCORPORATED

Printers
Engravers
Book Binders

Wholesale and Retail

MANUFACTURING
STATIONERS

SOLE AGENTS IN THE PHILIPPINES FOR

The Remington Standard Typewriter

The American Typefounders Co.—Presses, Type, Etc.

Herring-Hall-Marvin Safe.—Fire Proof Safes and Vaults

Edison Mimeographs.—Mimeographs and Supplies

Weber's Genuine Hyloplate.—School Black Boards

Carter's Ink Co.—Inks, Paste, Mucilage, Etc.

E. Faber.—Lead Pencils and Penholders, Rubber Goods,
Warranted to withstand climatic conditions

National Blank Book Co.—Blank Books of every description

Rand, McNally & Co.—Books, Maps, and School Supplies

Plaza Goiti = = Manila, P. I.

TELEGRAPHIC ADDRESS:
"TABACALERA"

HEAD OFFICE:
BARCELONA

COMPANIA GENERAL DE TABACOS
DE FILIPINAS

Established in 1882. **Capital: £ 3,000,000**

Shipping Department,
80 Escolta.

Manila General Office,
Calzada Marques de Comillas.

Retail Store,
80 Escolta.

BRANCHES AND AGENCIES
in the principal cities of the world and towns of the Philippines
Proprietors of the celebrated factories

"La Flor de la Isabela"

High grade cigars manufactured with the most selected leaf grown in the states of the Company.

SPECIAL BRANDS:

Pig's tails, Vegueros Especiales, Regalia A. Lopez, Regalia G. Pereire, Favoritos A. Lopez, Favoritos A. Correa, Perfectos Especiales, Exquisitos, Reina Victoria, Etc.

Excellent common brands.

"La Clementina"

Alcohol Manufactures—Gin—Distilled Spirits

GENERAL IMPORTERS AND EXPORTERS

A very extensive coastwise service with up-to-date Steamers

AGENTS FOR

COMPANIA TRASATLANTICA SS. CO.

(Spanish Royal Mail)

Direct service between Philippines, Spain, and England. Through tickets to and from New York issued. Lines of Steamers to all ports of the World.

CLARKE'S
MAYON COFFEE

THE MOST DELICIOUS BLEND OF SPECIALLY
SELECTED, PURE, PHILIPPINE
AND MOCHA BERRIES.

THE RECOGNIZED STANDARD OF EXCELLENCE
IN THE FAR EAST.

Sold in Specially Prepared Packages, Airtight, and Moisture Proof, Preserving the Delightful Aroma of the Coffee.

WHOLESALE AND RETAIL

M. A. CLARKE.

No. 2, Escolta. Manila, P. I.

CAMERON & McLAUGHLIN

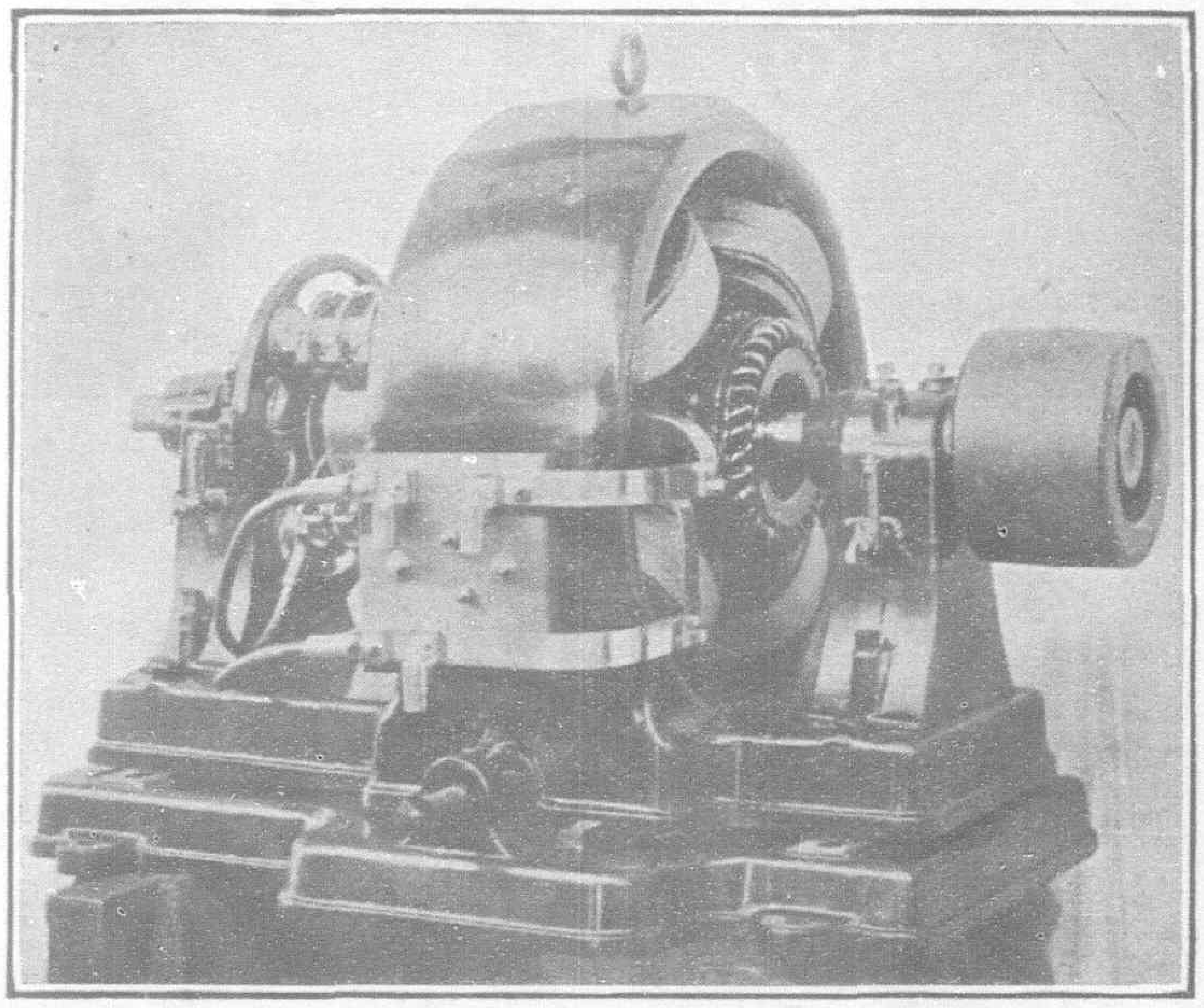
Calle Camba 111

P. O. Box 598. Telephone 329.

CABLE ADDRESS—"RONLIN"
CODES:—WESTERN UNION, A 1, LIEBER'S,
A B C., 5th EDITION.

School Furniture
Machinery
Khaki Cloth, etc.

Allis-Chalmers Co
CHICAGO



BUILDERS OF DIRECT AND ALTERNATING
CURRENT APPARATUS

COMPLETE EQUIPMENT FOR LIGHT AND POWER PLANTS

WE WOULD BE PLEASED TO RECEIVE YOUR SPECIFICATIONS AND QUOTE YOU PRICES

Bullock
Electrical Apparatus
for all purposes.

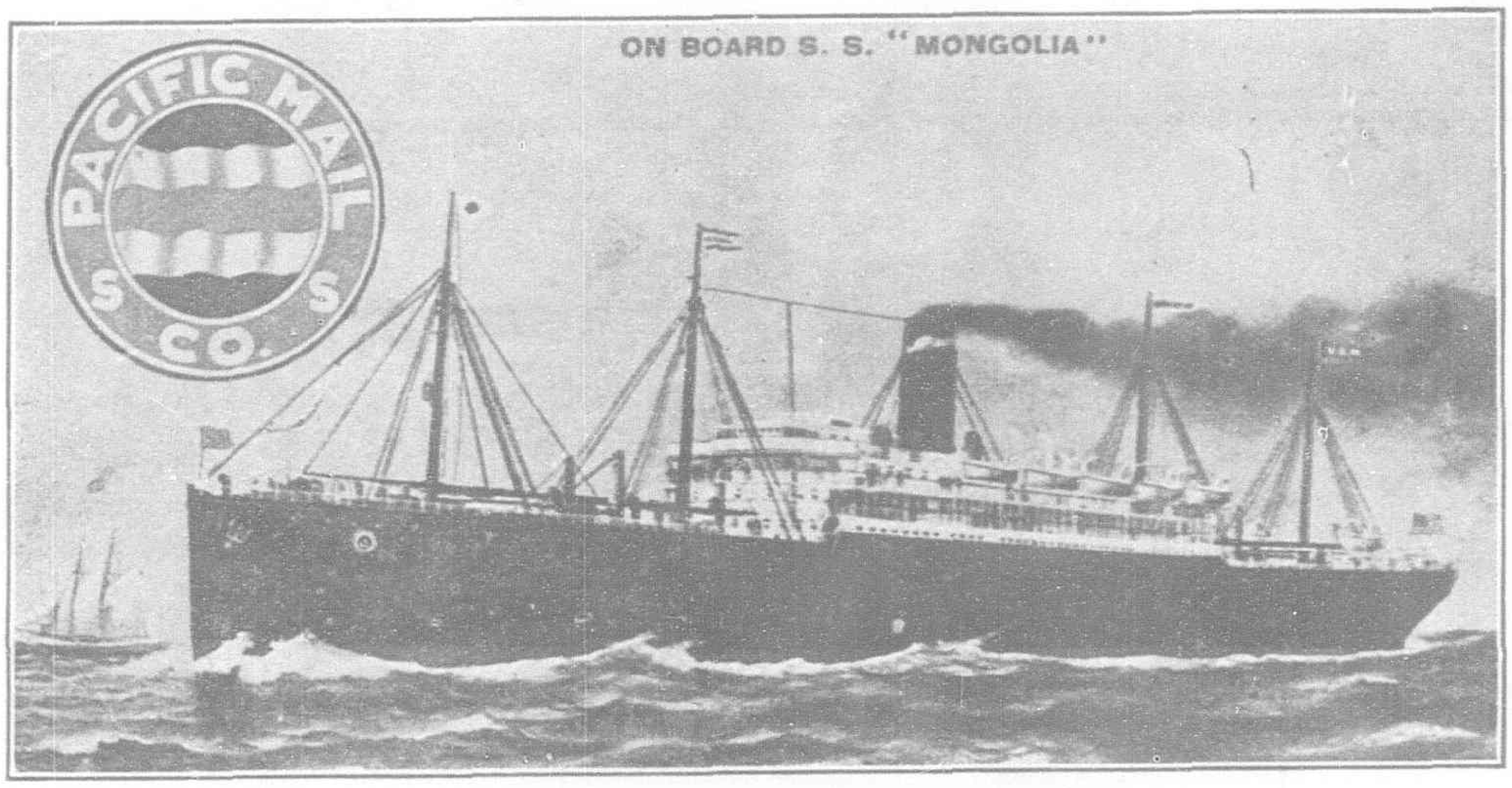
• PACIFIC MAIL STEAMSHIP COMPANY •

OCCIDENTAL AND ORIENTAL S. S. CO., TOYO KISEN KAISHA.

DIRECT SERVICE BETWEEN SAN FRANCISCO AND THE FAR EAST

SAN FRANCISCO
HONOLULU
YOKOHAMA
KOBE

NAGASAKI
MANILA
SHANGHAI
HONGKONG


ON BOARD S. S. "MONGOLIA"
PACIFIC MAIL S. S. CO.

AGENTS

AMOY—Douglas Lapraik & Co.
BANGKOK—Archibald Maclean & Co.
BATAVIA—Campbell, MacColl & Co.
BOMBAY—King, King & Co., Thos. Cook & Son. Army & Navy Co-operative Society, Grindlay, Groom & Co.
CALCUTTA—Jardine, Skinner & Co., T. Cook & Son. William Watson & Co., Grindlay & Co.
CANTON—Arnhold Karberg & Co.
CHEFOO—Cornabe & Co.
CHEMULPO—Holme, Ringer & Co.
COLOMBO Del ege, Reid & Co. and Thos. Cook & Son.
FOO CHOW—M W Greig & Co.
HANKOW—Ramsay & Co.
HONG KONG—E. W Tilden. T D McKay, Gen. Pass. Agt. San Francisco Overland Route.

AGENTS

KOBE—W. W. Campbell.
MACASSAR—Gebroeders Veth.
MADRAS—Leighton & Co.
NAGASAKI—Holme, Ringer & Co.
PADANG—Gebroeders Veth.
PENANG—Sandilands, Buttery & Co.
PORT ARTHUR—Kunst & Albers.
RANGOON—Thos. Cook & Son.
SHANGHAI—Fearon, Daniel & Co.
SINGAPORE—Gilfillan, Wood & Co.
TIENTSIN—Liddell Bros. & Co.
TSINGTAU—Carlowitz & Co.
VLADIVOSTOCK—Kunst & Albers.
YOKOHAMA—B. C. Howard. T. D. McKay, Gen Pass. Agt., San Francisco Overland Route.

FEATURES OF THE LINE

Southern route; passengers enjoy out-doors throughout; deck bathing. The call at Honolulu, Oahu, the most tertile and beautiful Island of the Pacific

The only line to San Francisco, the greatest port of the Pacific

Ships, being mail steamers, leave positively on schedule date from all ports.

ALEXANDER CENTER, GENERAL AGENT; A. G. D. KERRELL, PASSENGER AGENT; GENERAL OFFICE, 421 MARKET STREET, SAN FRANCISCO, CAL.

CASTLE BROS.-WOLF & SONS, AGENTS, MANILA, P. I.

3rd EDITION JUST PUBLISHED 1904

Witton's Manila and Philippines Directory

CORRECTED FOR DECEMBER 1904 TO DECEMBER 1905

₱ 10.00 CONTENTS ₱ 10.00

Streets Directory.
Internal Revenue Taxes.
Customs Tariff.
Civil, Municipal, Military and Naval Establishments.
Miscellaneous (Tariffs, Tables, Educational, Ecclesiastical, etc.)

The Philippines (Provincial Directory, Geographical and Trade sketch of the Islands).
Manila, Iloilo, and Cebu Commercial Directory
Classified Trades and Professions
Ladies' List
General Alphabetical

Map of Manila. Map of the Philippine Islands.

Witton's Manila and Philippines Directory

P. O. Box 948 "McCULLOUGH BUILDING," PLAZA GOITI, MANILA, P. I. Phone 127

PHILIPPINE GAS LIGHT COMPANY

SANITARY ENGINEERS AND CONTRACTORS.

ACETYLENE GAS APPARATUS
CARBIDE OF CALCIUM

HARDWARE AND ENGINEER'S SUPPLIES.
PLUMBER'S SUPPLIES.

126 to 132 Carriedo St.
MANILA, P. I

HARDWARE & PLUMBING.

Telephone No. 400.

Cable Address:
Federation—Hamburg
Tornow—Manila

Codes Used:
Lieber's; A.B.C. 4th and 5th Editions; A1; International Telegram
Vocabulary of 200,000 words; Private Hemp and Cigar Codes

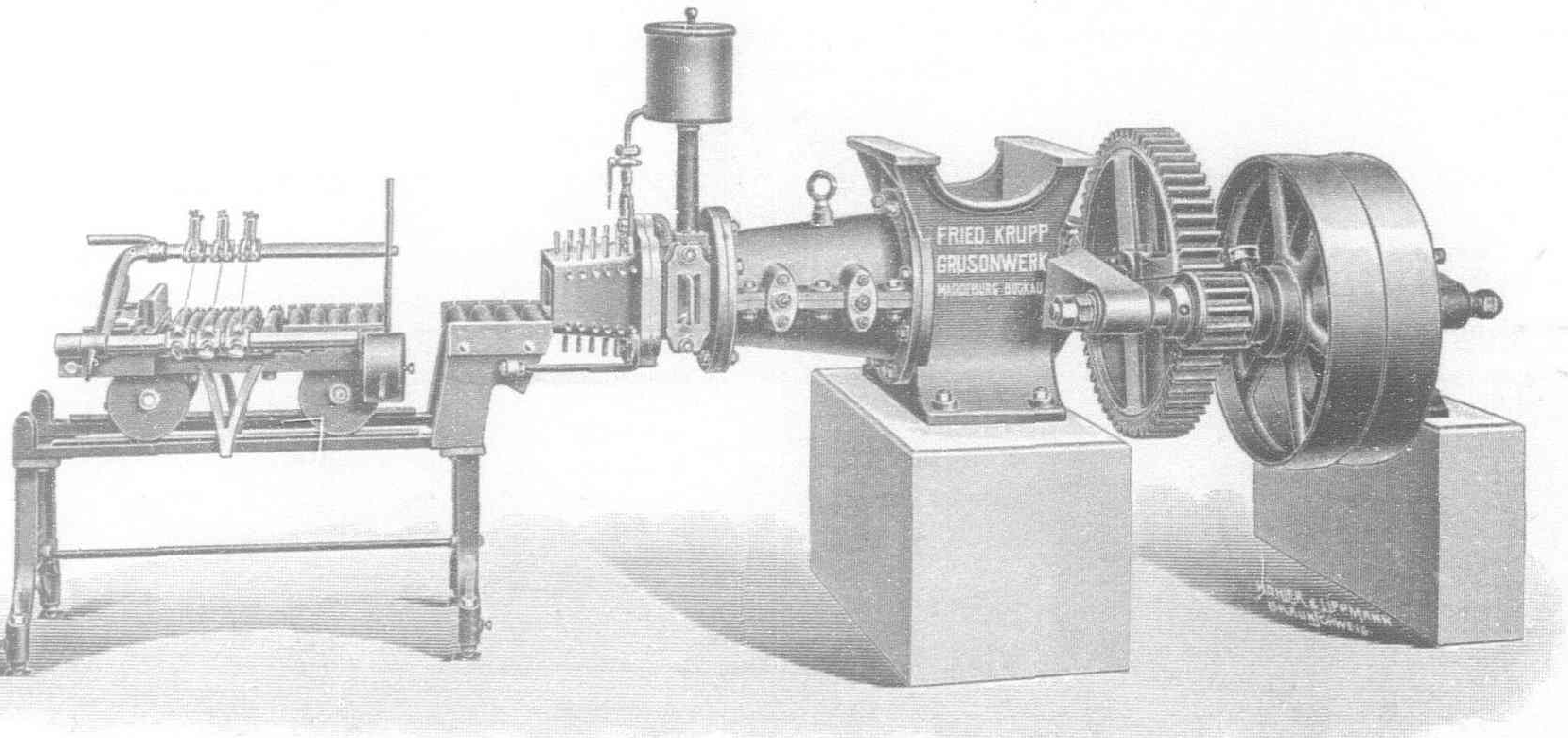
Germann & Co. Ltd.

HAMBURG
Hermannstrasse 27

Electrical and Engineering
Department
Escolta 100, Manila

MANILA, P. I.
San Jacinto St., 137
P. O. Box 310

Engineers, Electricians, and Contractors



COMPLETE OIL MILLING PLANTS A SPECIALTY.

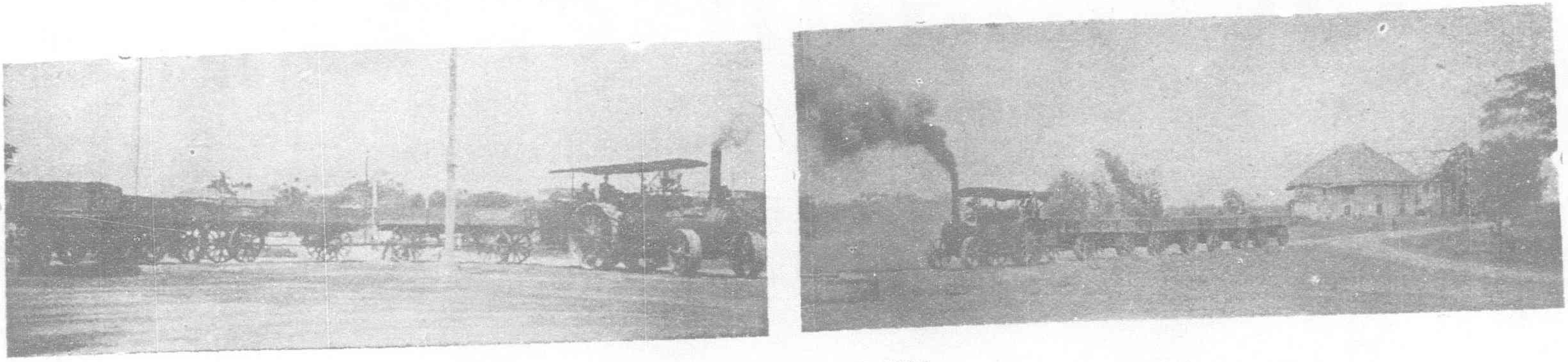
A plant of 7000 Kilograms Capacity per day has been erected for Messrs. Arnalot Hermanos, of Tayabas, and is now in operation.

REPRESENTATIVES FOR THE PHILIPPINES OF

Fried. Krupp, A.-G.	Essen-Ruhr.
Fried. Krupp, A.-G., Grusonwerk	Magdeburg-Buckau.
Siemens-Schuckert Werke, G. M. B. H.	Berlin.
Siemens & Halske, A.-G.	Berlin.
Gasmotoren-Fabrik Deutz	Coln-Deutz.
Berkefeld-Filter Gesellschaft, G. M. B. H.	Celle.

The Ammonia Company of Australia, Sydney, N. S. W.	
La Baloise Fire Insurance Co.	Basle.
La Baloise Transport Insurance Co.	Basle.
La Confiance Fire Insurance Co.	Paris.
Federal Marine Insurance Co.	Zurich.

THE KELLY-SPRINGFIELD ROAD ROLLER COMPANY



ROAD LOCOMOTIVE AND CARS

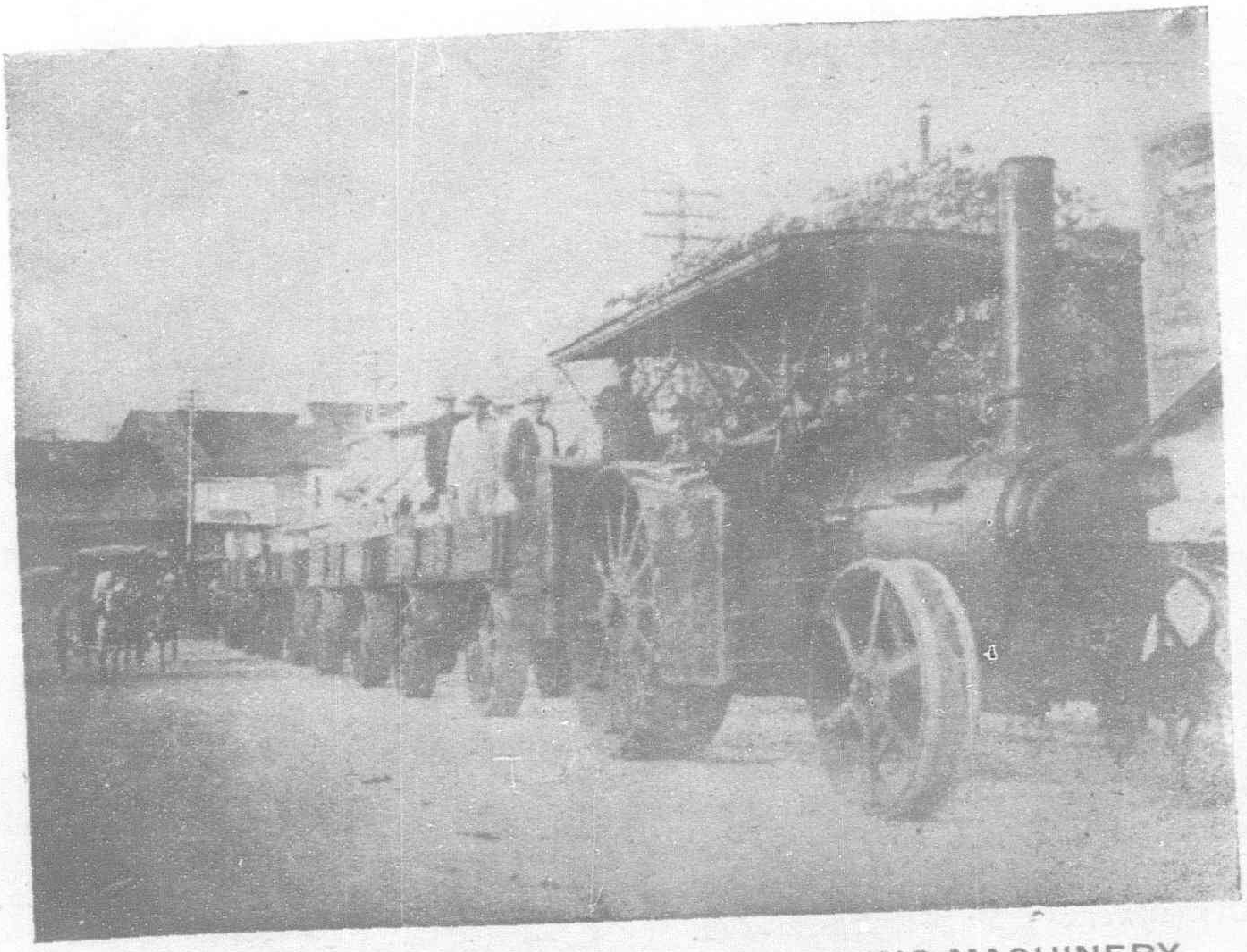
- Steam Road Rollers, 6-8-10-12-15-18 tons
- Concrete Mixers
- Tar tanks
- Kelly cable plowing outfit
- Kelly rubbertires and wheels

ROAD BUILDING AND MAINTAINING MACHINERY

- Drays and Floats
- Spring Drays
- Delivery Wagons
- Farm Carts
- Railroad Carts

All sizes locomotives for plantations, custom houses, public works and large locomotives for railroads

- Elevators, screens and bins
- Rock crushers of all sizes
- Tramways and cars
- Street sweepers
- Street sprinklers
- Stone wagons
- Garbage carts
- Dump cars, track iron, switches and turning tables
- Wagon loader, road builder and ditching machine
- Wheeled scraper
- Tileditcherandsewer builder
- Well machinery
- Hand sweepers, for streets
- Hand garbage carts



- Rock drills
- Coal Cutters
- Stone channeling machines
- Complete mining, tunneling and quarrying plants.

- Forges
- Blowers
- Drills
- All kinds of tools
- Derricks of all kinds for harbor improvements, custom house docks, buildings railway and bridge construction

RICE THRESHING, HULLING AND POLISHING MACHINERY.

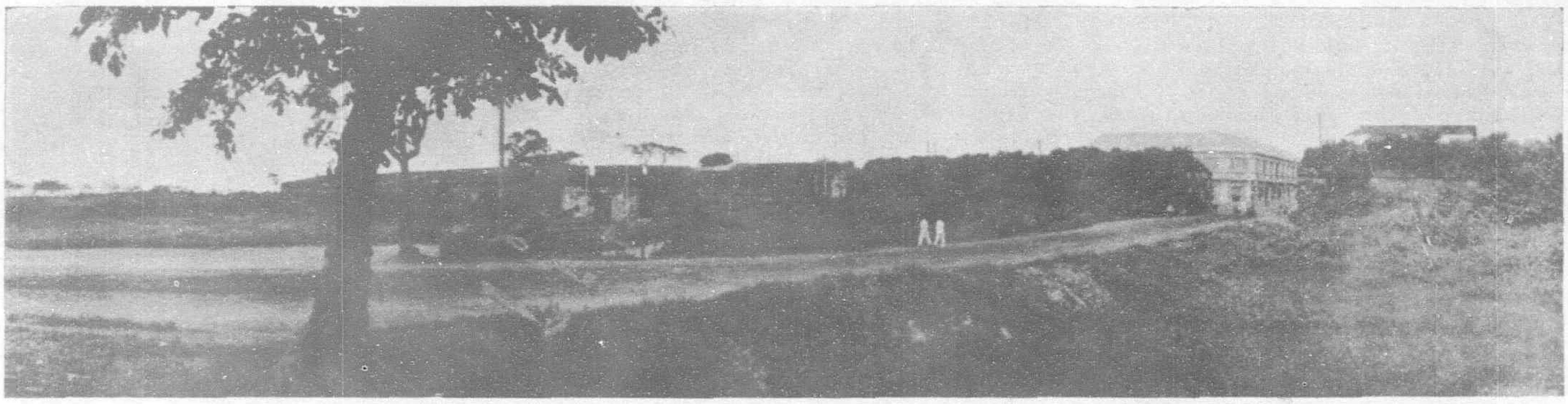
C. E. HELVIE, GENERAL AGENT

PARIS BUILDING 34 ESCOLTA MANILA, P. I.

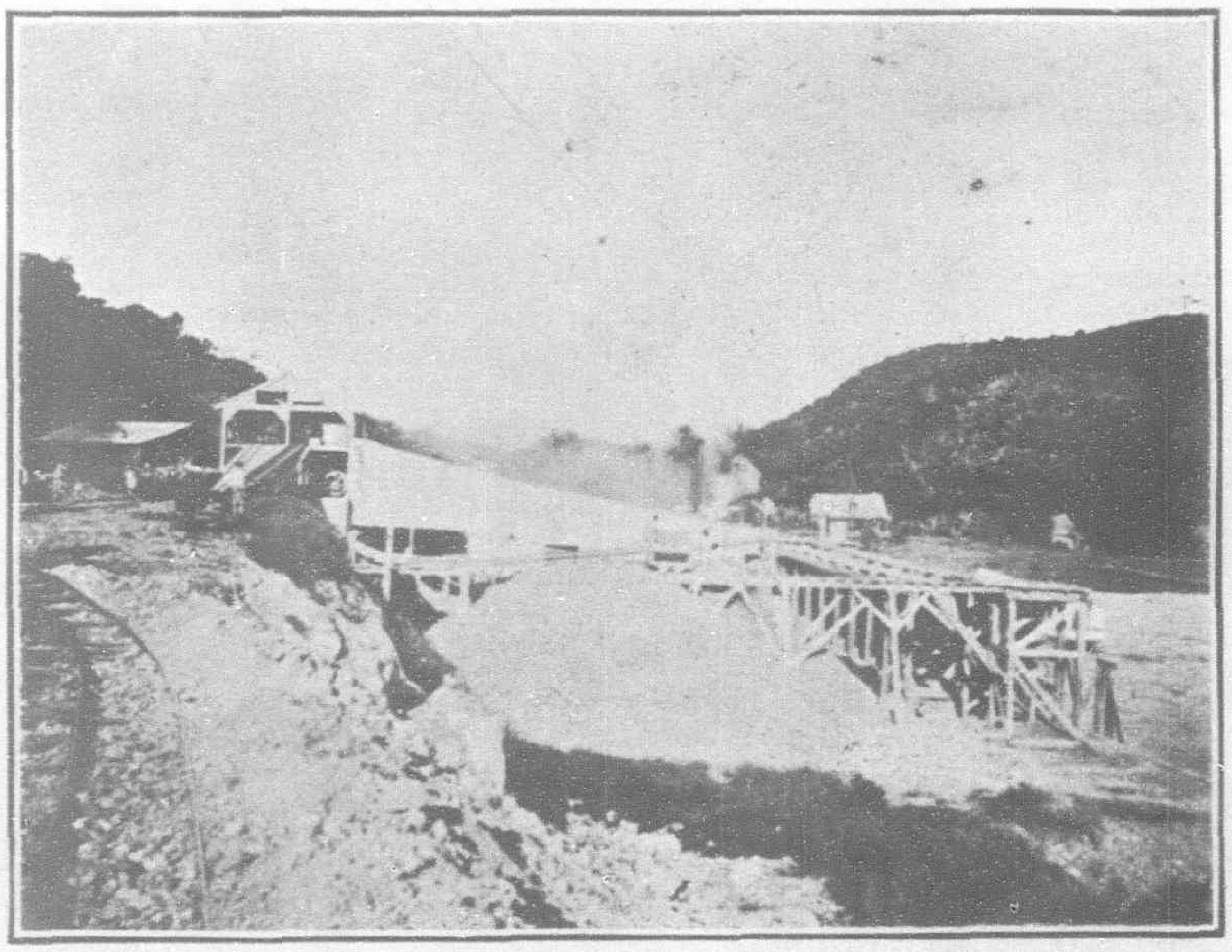
FAR EASTERN REVIEW

COMMERCE ◆ ENGINEERING ◆ FINANCE

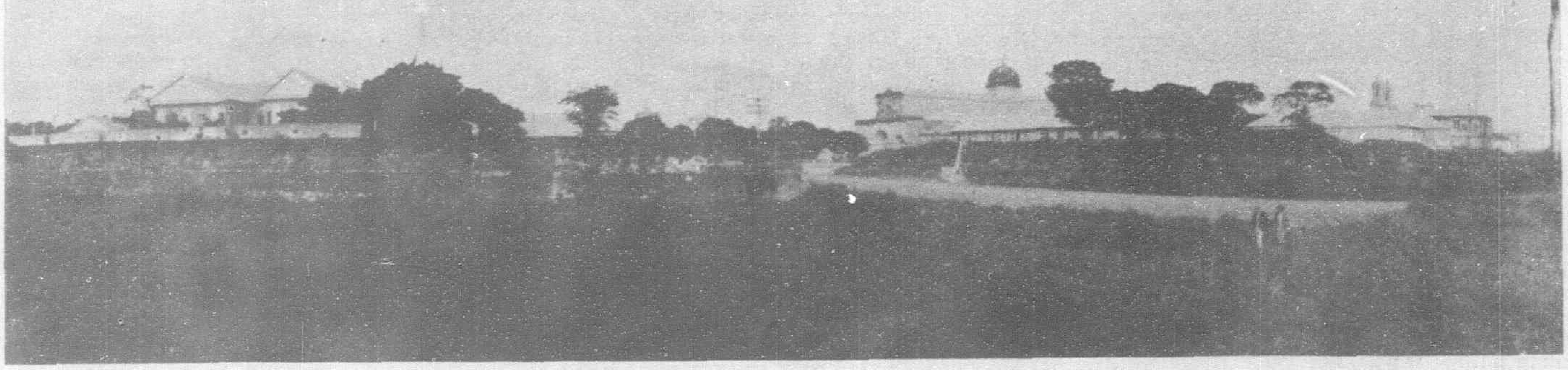
VOL. I. MANILA, P. I., FEBRUARY, 1905. No. 9.



PALACIO STREET EXTENSION, SHOWING OLD AND NEW GATEWAYS IN OLD WALL—NEW GATEWAY PROVIDING AN EXIT FOR THE NEW ELECTRIC RAILWAY.



CITY STONE-CRUSHING PLANT, TALIM ISLAND.



ADUANA STREET EXTENSION, COMPLETED—NEW OPENING IN THE WALL CONNECTING INTRAMUROS WITH THE MALECON.

FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

PUBLISHED MONTHLY

GEO. BRONSON REA, M. E.
PUBLISHER

McCullough Building, Plaza de Goiti, Manila, P. I.

A MONTHLY REVIEW OF FAR EASTERN TRADE, FINANCE, AND ENGINEERING. DEDICATED TO THE INDUSTRIAL DEVELOPMENT AND ADVANCEMENT OF TRADE IN THE PHILIPPINES AND FAR EASTERN COUNTRIES.

SUBSCRIPTION RATES: Philippines, United States, Canada, and Mexico, $2.50 U. S. C. per year. To all other countries in the Postal Union, $3.00 per year. Single copies 25 cents, U. S. C.

ADVERTISING RATES will be mailed on application.

ENTERED AT POST OFFICE, MANILA, P. I., AS SECOND CLASS MATTER.

Address all communications to the "Far Eastern Review," Manila, P. I. Make all checks, drafts, postal orders, etc., payable to "Geo. Bronson Rea."

—AGENTS:—

KELLY & WALSH, LD., Hongkong. Singapore. Shanghai. Yokohama.

L. P. FISHER, Advertising Agency, Montgomery St.
San Francisco, Cal.

MANUFACTURER'S ADVERTISING BUREAU,
Mr. Benjamin Western, Mgr.
126 Liberty St., New York, N. Y.

MANILA, FEBRUARY, 1905

PUBLISHER'S ANNOUNCEMENT

The publisher of The Far Eastern Review and La Revista Filipina takes pleasure in announcing that Mr. Robert B. Westcott, a newspaper man of large experience and recognized ability, has joined the staff of his publications as Associate Editor. In my absence from the city henceforth, Mr. Westcott has full power to represent me in all matters of business pertaining to The Far Eastern Review and La Revista Filipina, and to sign *per pro.*

Geoger Bronson Rea, Publisher.

THE COOPER BILL

Since our last issue the congressional measure for the construction of railroads in the Philippines by private parties, under a guarantee by the Insular Government of 4 per cent on the capital invested, and authorizing the bonding of provincial municipalities for permanent public improvements, etc., familiarly known as the Cooper Bill, has become a law at Washington by passing both houses of Congress and receiving the signature of President Roosevelt. The law authorizes the Commission to raise $5,000,000 on municipal bond issues which are to be based upon 5 per cent of the assessed valuation of the cities to benefit, and this matter is already under consideration. It is estimated that $2,500,000 will be a sufficient sum to complete the improvements now under way, which include harbor works, the Pasig River works, the Benguet Road, the summer capital at Baguio, and lighthouse construction. This will leave a like sum to be authorized in future throughout the Islands as occasion demands. The Commission now has under consideration the plans for the first bond issue under this section of the law, and it has expressed the belief that the bonds thus floated will find ready and satisfactory market in the homeland.

With reference to the building of railroads the Commission is inclined, at this writing, to advertise for bids for the work, and the party or parties who receive the contract will be those who will pay the largest percentage of returns by way of taxation, or request the smallest rate of interest on the guarantee; also who will fix the lowest rates for transportation of freight and passengers, complete all or part of the system in the shortest time, and comply with other regulations most favorable to the Government and the people of the Philippines. Whether the whole system, which, as a starter, will be confined to the Island of Luzon, will be let to one set of capitalists, or to separate syndicates, is a matter which the Commission will be called upon after a-while to decide.

It is estimated that this railorad clause of the law will be the means of bringing many millions of dollars into the Islands for this particular line of development. It is also stated that four syndicates have already organized in the United States to bid in the railroad bonds when they are placed upon the market, and there is every indication of lively competition for the Government's 4 per cent guarantee.

While the much-needed tariff legislation dovetails nicely into the important features of the Cooper Bill, its failure at this session of Congress, or the next session, for that matter, will in no way interfere with railroad building. The Government guarantee of 4 per cent on the investment is the saving clause. It is regarded by all promoters of big financial enterprises as a liberal concession to enormous capital and is in itself an inducement for the investment. Under it the railroads are assured in spite of the fight on the tariff, and with their construction will come a general opening up of the country and the consequent rejuvenation of agriculture along surpassing lines. Railroads will do more toward bringing about settled conditions in the provinces, and prosperity to the people, than any other factor. They will be the forerunner of industry throughout the land and be a stern yet beneficial influence over the people. When the tariff is regulated along the lines insisted upon by the President it will give a great impetus to railroad earnings and in time insure sufficient traffic to more than clear the Government from responsibility for its 4 per cent guarantee.

Now that the Cooper Bill is a law we may expect to see American capital come into the Islands in large sums for all sorts of investment. Mining and forestry are bound to benefit largely; agricultural lands will be in great demand, and where money is now lacking to give the farmer some backing that will put him on his feet, it will be plentiful. We cannot help but be optimistic of the future in the face of the outlook.

PHILIPPINE SUGAR INDUSTRY

That our friends in Washington are laboring under the necessity for some intelligent and expert advice on the Insular sugar and tobacco industries, is made manifest in a recent cable message from the Secretary of War to the Governor General, in which he urges the formation of a committee, or the appointment of a delegate, to answer technical questions before the Congressional committees having Insular legislation in charge. This vital requisite in pushing through favorable legislation, in the face of powerful opposition, has apparently been ignored by the Administration in Philippine matters. As against the expert lobby of the refining and beet-sugar trusts, conversant with every phase of the sugar industry, with facts and figures at their fingers' ends to be twisted around at their convenience, the Philippines have had as their representatives a few politicians or merchants whose technical knowledge of the subject has been practically nil, and who apparently have made little or no effort to refute some of the glaring inconsistencies of the opposition. As was to be expected the Philippine interests have made no headway, and as a last resort the Administration, seeing the hopelessness of the situation, has been forced to seek assistance.

It goes without saying that no expert advice can be secured for the Philippines in the United States—it must come from the Islands to bear weight. In view of some of the arguments employed by the opposition it is high time that some definite action be taken in this matter, if the Islands ever hope to secure any concessions from Congress. Although it is impossible from this distance to secure a direct line on the opposition tactics, we have gleaned some information from the columns of the recent *Congressional Records*. In the Senate debate on the Cooper bill on December 16th, Senator Dubois of Idaho, a champion of the beet-sugar trust, made the following biased remarks:

"There are in the Philippine Islands some 72,000,000 acres of land, only 5,000,000 acres of which are in the possession of individuals or corporations. The other 67,000,000 acres are public lands, and, as a general thing, they are exceedingly rich for agricultural purposes. Some 50,000,000 acres of land in the Philippine Islands are susceptible to the highest cultivation, and this is especially so in regard to sugar. In Louisiana, in Texas, and in other favored spots in this country they raise from 1 ton to 1½ tons of cane sugar to the acre; in certain other favored portions of our country they raise from 1 ton to 1½ tons of beet sugar to the acre; in Cuba they raise about 4 tons to the acre; in Porto Rico, about 4½ tons; in the Hawaiian Islands, 4 to 4½ tons; and on some plantations in Hawaii they raise as high as 10 or 11 tons to the acre; *and the Philippine Islands are more productive for sugar than the Hawaiian Islands*"

This is an excellent example of the tactics of the opposition, showing as it does the unwarrantable exaggeration in everything connected with the tropical cane sugar industry, and conveying a false idea of the possibilities of the Philippine yield. Broad, unqualified statements of this nature operate against us, and are taken for gospel truth by the uninitiated.

The main points in the statement are fairly correct, although the figures are stretched to the fullest yield under the most favorable conditions, and cannot be accepted as normal or average. It is however, the unfair comparison of the closing words of the paragraph to which objection must be taken. All tropical sugar lands under natural conditions, that is, without the aid of scientific fertilizing, cultivation or irrigation, will produce an average of 3 tons of sugar to the acre, or rather 30 tons of cane. The best virgin lands will run about 4 to 4½ tons for the first two years, and then dwindle down to 1½ to 2 tons. It is true that on some estates in Hawaii 10 to 12 tons of sugar are produced from an acre of cane, but to state immediately afterwards, without any qualifying remark, that the Philippine Islands are more productive than Hawaii, demonstrates a dense ignorance of the subject matter, or a willful attempt to distort the facts in favor of the beet sugar industry.

The Hawaiian plantations producing 10 tons of sugar to the acre are very few, and to secure this phenomenal yield the most modern scientific methods are employed, from the time the cane is planted till the sugar is turned out of the centrifugals bagged for market. Fertilizing on a large scale is necessary, and the most elaborate and costly systems of irrigation are employed It is a mooted question whether the increased yield compensates for the enormous capital outlay and operating expenses incurred. The plants alone are valued at more than the immense mill plants, and cost more to operate in proportion to the power used. We have in mind a contract for the erection of a Hawaiian sugar house where the mill plant cost $450,000, and the pumping plants for the required acreage $550,000.

The Hawaiian plantation depending for its water upon the natural rainfall, will yield the average of 3 to 4 tons of sugar per acre. To state that the Philippines are more productive than Hawaii, in comparison with the yield of 10 to 11 tons, is grossly incorrect, and even when we take the normal average under natural conditions of 3 tons to the acre, we are confident that the Philippines cannot pass much beyond it, except on virgin soils, and by virgin soils we mean cleared forests and not the grassy bottom lands.

Granted that the Islands can produce 4 tons of sugar to the acre, to secure this yield the most modern machinery and mills must be emplyed. At present not two tons are produced.

This constant struggle of the home sugar industry to preserve the home market for its own tardy development, appears to us something like the little boy whose eyes were bigger than his stomach. It is a commercial impossibility for the beet industry to keep pace with the increase in consumption, let alone trying to hog the whole market. For several years we have heard the crying and yelling of the infant above all other sounds in the national legislative chamber. "Protect us from the boogaboo man in the Philippines!" has been the constant cry. "We can supply all the sugar needed for the home consumption—if you will only put a high fence around the little brown ogre, so he can't eat us up." And the baby has been petted and given its sugar pap, and has clapped its hands and goo-gooed in glee. But it has not made good.

Although the consumption of sugar in the United States increased over 500,000 tons in the five years from 1898 to 1902, the baby only contributed 100,000 tons to the increase. In 1900 the consumption increased nearly 900,000 tons over the preceding year. The "kid" contributed with 20,000 tons. The consumption nearly doubled in twelve years, from 1890 to 1902, or to be more exact, it jumped from 1,476,377 tons to 2,566,108, and the demand is steadily increasing. Of the latter figure, only about 500,000 tons were produced in the United States; the balance imported.

LADRONISM

The recent outbreak of ladronism in the neighboring provinces of Cavite and Batangas has been given a rather undue prominence in the columns of our local contemporaries. To one not thoroughly acquainted with the situation a perusal of the news would give the impression that another bloody insurrection was already in progress, and that the entire resources of the Government were taxed to cope with the disorders. It is true that we have had a disturbance of the peace, and that prompt and drastic measures were employed to nip the movement in the bud, but at no time was it serious enough to warrant such a waste of good newspaper space and indiscriminate abuse of scare heads. Undue prominence given to this class of news is to be deprecated at present, and care should be taken to qualify any statement which could be distorted to our injury by the interests pooled against our development and the granting of favorable legislation.

Ladronism, as it is termed in the Philippines, is a chronic state of disorder existing in every Latin-American country and the Far East. Brigandage is carried on to a more or less extent in all poorly developed and sparsely inhabited territories, and the crimes committed fail to attract any more sensation than the ordinary city disturbance. It is only when some unusual activity on the part of the bandits, such as the looting of a small town, that the law-abiding inhabitants seem to wake up and take cognizance of the real state of affairs. A short, sharp persecution on the part of the authorities, and the bands are scattered, and for a few months it looks as though the evil had been eradicated. On the first relaxation of vigilance, however, the criminals again resume operations.

In a country like the Philippines, where the inhabitants are largely in sympathy with the evil-doers, and contribute to their success by withholding information from the authorities, and in other ways rendering assistance, the suppression of the evil must necessarily take year.

It is a well-known axiom that you can't whip a man if he won't let you. As long as he keeps running away, all his antagonist can do is to run after him and use up his strength in a vain effort to get his opponent in a corner. Our experience with the ladrones and pulajanes is but a repetition of what Spain had to contend with in her colonies. We have seen in our experience a band of outlaws numbering about twenty-five men terrorize the entire Province of Havana, in Cuba, levying tribute on every sugar planter and defying the efforts of the government to suppress them. Several regiments were in the field at one time to capture the band, but the sympathy of the native population for those of their own race, enabled them to escape the pursuing troops. The writer has lived the life of the hunted, and knows whereof he speaks. Two years with the Cuban insurgents initiated him into all the secrets of this peculiar type of warfare. When General Weyler, after months of weary pursuit after the elusive insurgents, promulgated his famous Reconcentration Order, he hit on the only solution of the problem.

The ethics of this system, while abhorrent to a reactionary population, are entirely justifiable from the standpoint of the authorities. Either you are with us or against us, it says to the native, and after ample time is given for those living in the country to concentrate in the towns, those remaining in the field know what to expect. That Weyler has been amply vindicated in this policy is shown by the use of the same tactics by England in the Boer War, and by the Americans in these Islands in dealing with the late insurrection. It was reconcentration that not long since purged the fair Province of Albay of ladronism. It is the only effectual manner of crushing a lingering opposition to the Government.

It is clearly evident that in conditions such as exist in Samar, the apparently peaceful *tao* who lives in the country or mountains is permitted to do so by the outlaws because he is friendly and serves their interests. If it were otherwise, his life would be the forfeit.

It must be borne in mind that reconcentration always originates with the insurgent or outlaw. On assuming active operations and open defiance of the authorities, all inhabitants suspected of a leaning toward the Government are either killed or forced to concentrate in the towns. Those permitted to remain must necessarily be friends and spies. The imposition of similar methods by the authorities is always used as an argument by friends of the outlaws or insurgents to show the brutality of the Government, and justify their further opposition.

While conditions in Cavite and Batangas and Samar may never call for such radical action, yet we believe that this is the only effective manner of cleaning up the disturbed districts and rooting the criminals out of their hiding places.

This state of affairs, however, is not necessarily alarming nor should it be looked upon as a pretext for sensational news stories. It is simply a natural sequence to our taking over the Islands, receiving its moral support from the native community at large. As long as bandit leaders style themselves major-generals, confer military rank on the dupes under them, receive support from leaders in the towns, and have their actions condoned by the native press, just so long will misguided youths be found to swell their ranks. The more publicity given the deeds of the criminals, the greater becomes their vanity and hold on the ignorant. Every mention of their name is hailed with glee, and the newspapers are read before the band to show the dupes how great and important their actions have become, thus nerving them to further excesses and continued opposition to the Government.

MR. SHUSTER'S TARIFF REMEDY

Mr. W. Morgan Shuster, the Collector of Customs for the Philippines, has presented to the Civil Commission a scheme to offset congressional failure to reduce the tariff on our products into the United States. He suggests that the Insular Government cut loose entirely from Congress in this important matter and "go it on their own hook" to the extent of refunding to the exporters the duties collected in the homeland on their goods. Under the Philippines Act passed by Congress all duties collected in the United States, on Philippine imports, must be refunded to the Insular Government for its maintenance, and taking advantage of this fact Mr. Shuster says that the Commission has authority to dispose of this money at will. Therefore, he can see no obstacle to prevent the Insular lawmakers from making good to the exporters.

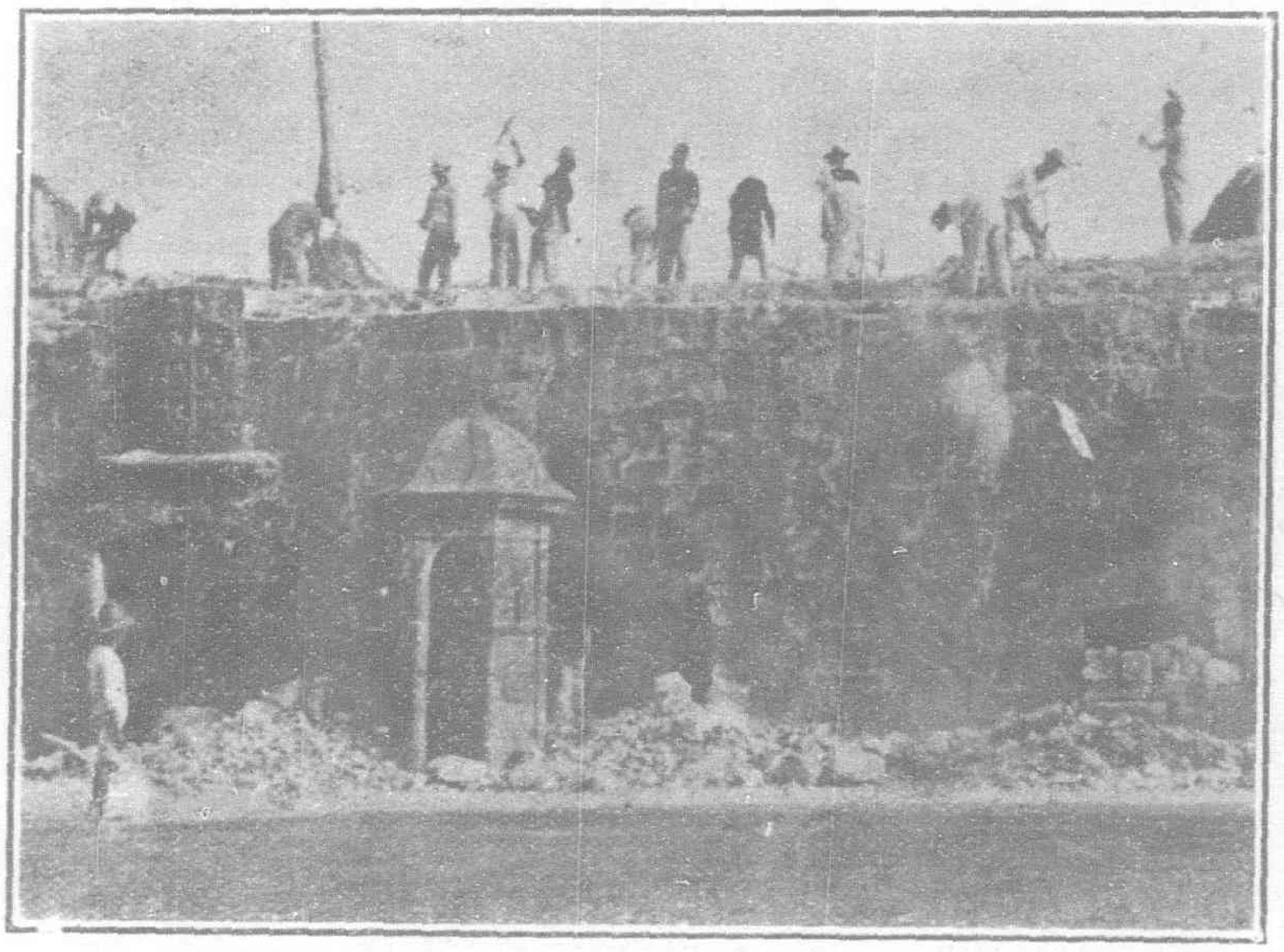
Now, if the Insular Government were a horse-trader with an animal of "shady points" to get rid of, and the American Congress an ignorant buyer of horses, with nothing more than a horse-trade at stake, it might be fair under the ethics employed by such tricksters for the Philippine Government to resort to underhand methods in this matter of the tariff, but otherwise we can find no sane reason why, so far as we are concerned, trickery should be given any part in our fight for what rightfully and in justice should be given to the Filipinos by the people of the homeland. When Congress enacted that law which gives the Insular Government the benefit of all duties collected at home, from our exports, no doubt the intention was, and still is, that the Government should use this money for the general welfare of the Filipinos. We do not believe it was ever intended that these refunds should pass through the Commission to the exporters, and while we are in hearty accord with every effort the Government is making to relieve us of the tariff burdens, we cannot subscribe to any action that would reflect discredit upon our Government in the homeland

Aside from the moral principle involved, it is apparent to us that the Insular Government would not dare defy Congress in the manner suggested by the Collector of Customs. It is not believed that President Roosevelt would stand for such a course a single instant, and just as certain as the Philippines exist Congress would not. It would be as much as the official positions the Governor-General and his colleagues hold in the public service are worth, for them to adopt any such drastic policy. The Governor-General and the Commissioners know this only too well, and not one of them would be foolish enough to jeopardize his official reputation by going on record as favoring the scheme.

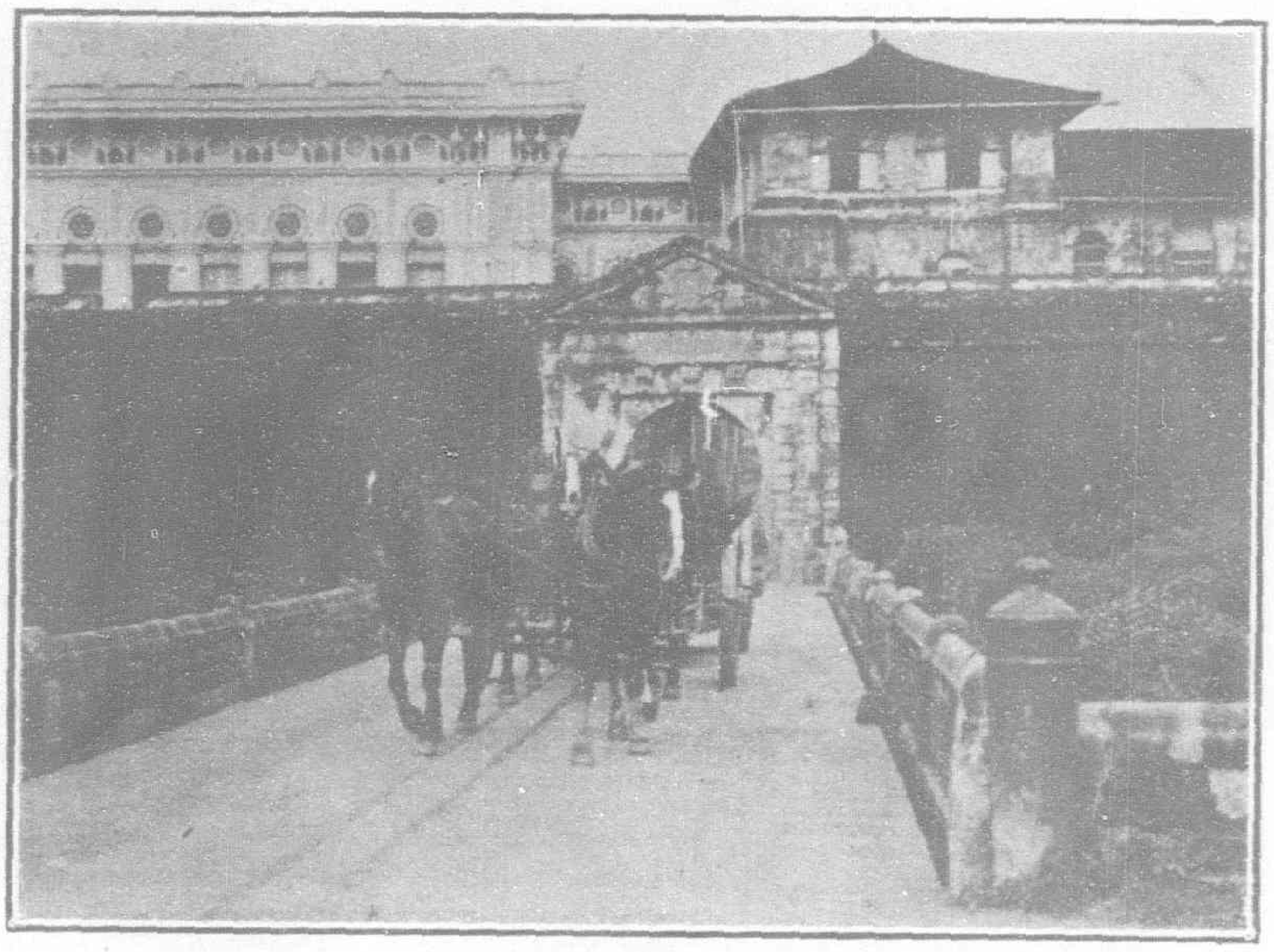
The fight which is still ahead of us to induce Congress to recognize our rights in the trade with the homeland will be a gigantic one, but it must be carried on along honorable and open, yet fearless, lines. We are not whipped yet and as right is bound to prevail in the end it is reasonable for us to assume that eventually Congress will defy the trusts and come to our assistance. Let us, then, organize our brains and capital for the struggle at Washington, and above all else let us be fair and straightforward in our dealings, not only among ourselves but with the Government and Congress at Washington.

We have an abiding faith in the sense of fairness and justice underlying the American character, and when our case is presented in a straightforward, business-like manner by those who understand conditions and are able to refute the biased arguments of the trust, we can expect just and honorable treatment in return.

Up to the present our interests have been in the hands of politicians and merchants not directly concerned in the issue and lacking the necessary and rudimentary knowledge of the industries most involved. From the political and legal standpoint we have had the best talent to back us, but they have been unable to answer the technical and commercial arguments advanced by the opposition. We stand at the point where the Administration has been practically compelled to acknowledge that it has exhausted its ammunition from its knowledge of the industries affected, and Secretary Taft has called for assistance to refute the technical testimony of our antagonists. We are confident that when these points are cleared away by competent authority, we will have no necessity to descend to such a radical step, even admitting its practicability, as that proposed by Mr. Shuster.



PALACIO STREET EXTENSION—BEGINNING WORK ON REMOVAL OF OLD SPANISH WALL.



SANTA LUCIA GATE—SHOWING WIDTH OF GATEWAYS ENTERING WALLED CITY.

MANILA'S PUBLIC IMPROVEMENTS

WORK OF THE MUNICIPAL ENGINEERING DEPARTMENT 1904

The annual report of the Municipal Board of Manila just made public deals extensively with public improvements which have been completed during the last year, and details the progress of those begun in the period. The illustrations which are herewith produced in connection with excerpts from the report show the most important improvements undertaken, and give the uninitiated a very fair idea of the reconstruction of Manila into a modern and a beautiful Oriental city.

STREET CONSTRUCTION AND BRIDGES.—For the purpose of administration and of systematizing the work the city has been divided into districts as follows:

District No. 1: Intramuros, Ermita, and Paco west of Paco Estero.

District No. 2: San Nicolas, Tondo, and Binondo.

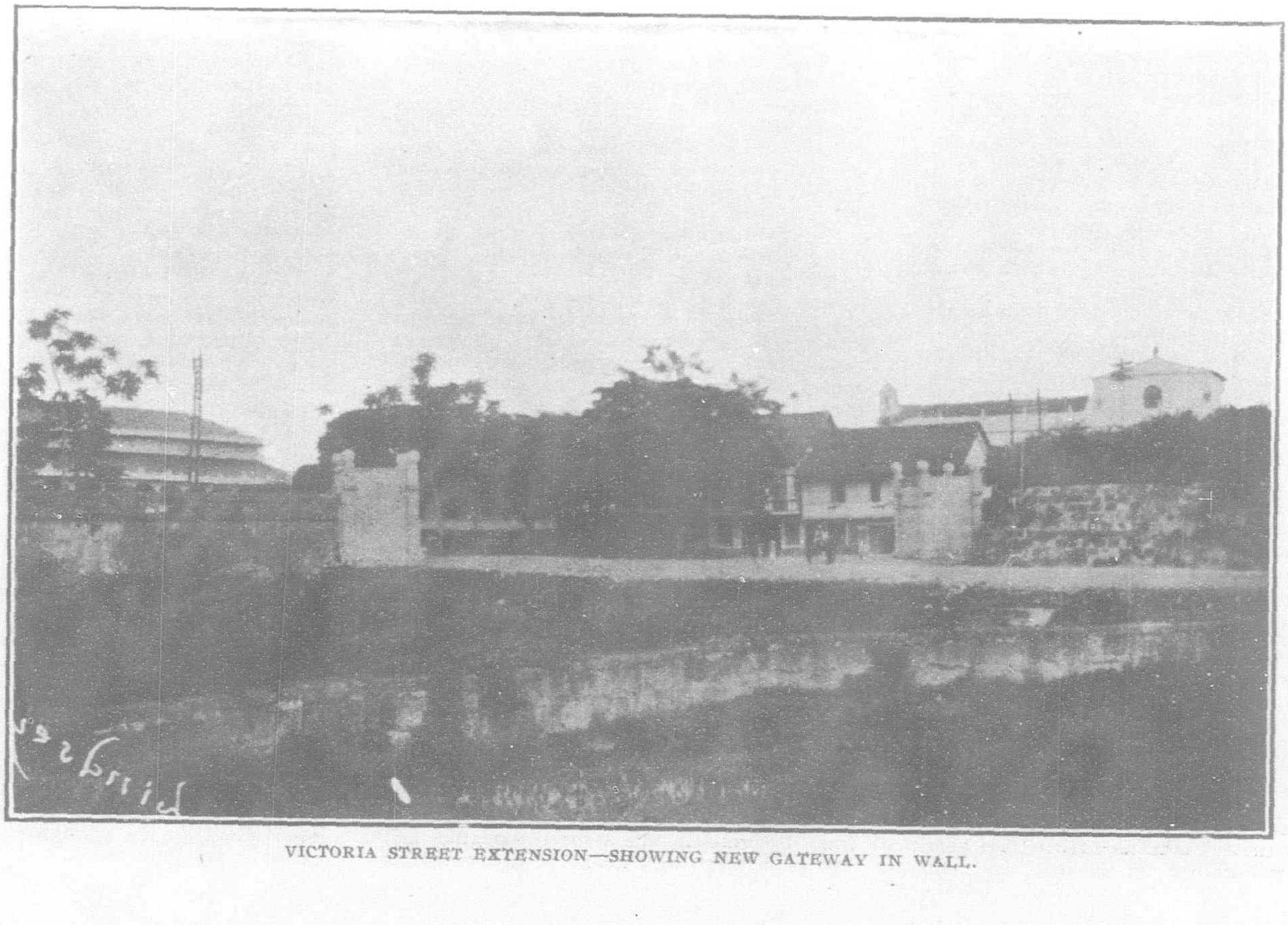
District No. 3: Santa Cruz, Quiapo, Sampaloc, San Miguel, and Santa Mesa.

District No. 4: Paco east of Paco Estero, Malate, Santa Ana, and Pandacan.

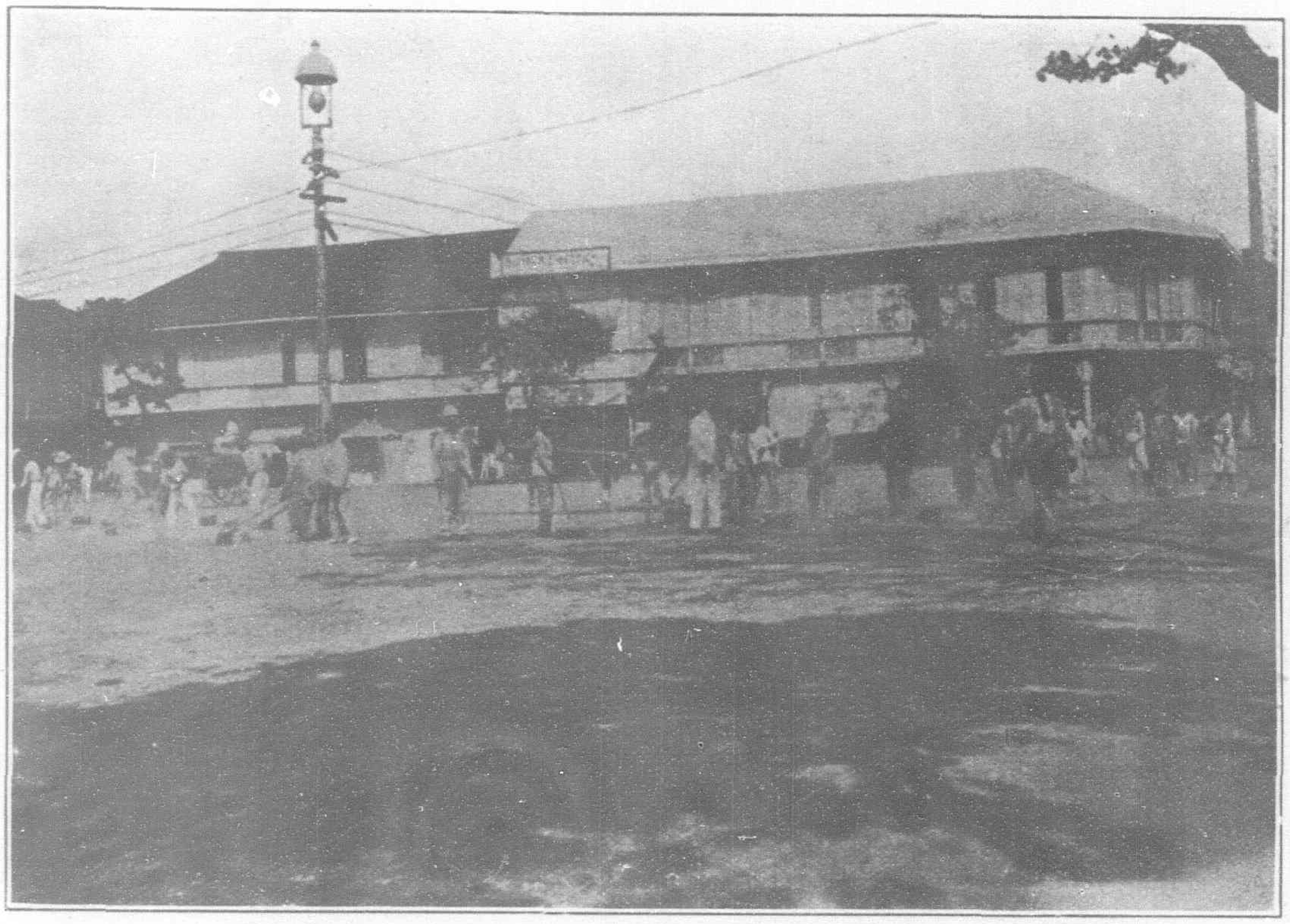
Bridge District: One district for city.

Each district is in charge of an inspector who reports daily to the superintendent the condition of his district, progress of work under way, etc.

Three extensions of streets through the city wall have been made, on Calle Aduana, Calle Victoria, and Calle Palacio, thus affording means of access to the Walled City. The former entrances crossed the moat upon a narrow bridge and passed through openings in the wall wide enough for one team only.



VICTORIA STREET EXTENSION—SHOWING NEW GATEWAY IN WALL.



STREET CLEANING.

The inconvenience caused to traffic compelled to use these narrow and serpentine entrances was enormous, and the danger of accident not small. The Aduana and Victoria extensions are new openings which afford safe and easy entrance through the walls at places where there was no entrance formerly, and save a long journey around for many teams daily. The Palacio extension is a new opening at one side of the former entrance. There are still two gates which should receive attention and be either widened or have new entrances made near their present location, namely, the Santa Lucia and Parian Gates at either end of Calle Real, Walled City. This street accommodates a large traffic and leads directly from the new port works through the center of the Walled City, connecting at its eastern end with the Bridge of Spain and the Santa Cruz Bridge over the Pasig. The construction of a short branch across the outer moat would also connect directly with Calle Concepcion and the Ayala Bridge.

The length of streets is now approximately 145,550 linear meters, or 90.4 miles, and the pavement of the city consists of wood blocks, granite blocks, and macadam, apportioned as follows:

	Square meters.
Wood blocks	3,969
Granite blocks	50,695
Macadam	1,293,534
Total	1,348,198

REMOVAL OF CITY WALL FROM ADUANA GATE TO THE ALMACEN GATE.

The work of demolition was commenced May 28 and completed on January 15, and the work was performed by prison labor, under a guard of one American and three native patrolmen.

The work performed by the prisoners was of a fair quality, although not equal to the average laborer on street work, as their physical development was not as good. Two gateways and nineteen casements were removed, making approximately 6,386 cubic meters of wall removed.

The use of dynamite was tried on three casements, and was found to be a very cheap and quick way of razing the wall. The charges were placed inside the casemate about four feet below the springing line of the arch, thus allowing the arch to fall in when the blast was made. The above blasts were made just at the end of the dry season, but after the rainy season commenced the stone became saturated with water, making them so spongy that it was impossible to use dynamite to advantage.

CEMENT GUTTERS.

The construction of the cement gutters have given much-needed relief, and it is the intention to continue this work so as to cover all districts where trouble has been experienced from stagnant water standing in the street. These gutters allow of a thorough flushing, and keep the roadway in better repair, as they obviate the trouble experienced by the water seeping in to the roadbed. These 30-centimeter gutters or half tubes were originally bought by contract, at so much per linear meter delivered on the site of the work; the cement gutters installed in the District of San Nicolas, however, have been built in place and at a much lower rate per meter than those bought by contract and it is the intention to have suitable forms made so that all this work may be built in place.

The sewer department is at present engaged in designing a system for the disposal of surface water, which will enable this office to install gutters and curbing and thus put the streets in a much better sanitary condition.

CEMENT CURBING.

The cement curbing installed during the last eight months has been built in place. Formerly this curb was made in meter lengths at the city shops and then hauled to the street and installed. It has been found much cheaper and more satisfactory to build the curb in place by setting the wooden forms to line and grade, then depositing the concrete and allowing it to set for twenty-four hours, afterwards removing the forms and facing the cement up. The curbing as built in place is 18 inches in depth, 6 inches wide at the top, and 8 inches at the bottom. The cement used has been Green Island Portland (Hongkong brand), mixed in the proportion of 1 : 2 to ½ : 5 for the lower portion, and 1 : 1 for the 1-inch facing from the top. The average cost of this class of curb 1 mile from the city shops has been -P-1.948, Philippine currency, per linear meter. Portland cement figured at -P 4.90, Philippine currency, per barrel; sand at -P-1.20, Philippine currency, per cubic meter and broken stone at -P-2.36, Philippine currency, per cubic meter.

STEAM ROLLERS.

There are three 12-ton rollers in the department. Two are Buffalo Pitts and one is the Springfield-Kelly make. These rollers are in fair condition and have run three hundred and twelve days each during the past year.

The following statement shows the cost of operating one roller per day:

1 engineer, at -P-150 per month	-P- 3.76
1 oiler and assistant	1.20
1 waterman	1.00
Total labor	7.96
510 pounds Australian coal, at -P-13.86 per ton	3.16
Oil, waste, etc	1.32
Repairs	1.30
Total daily cost of operating	13.74

CITY QUARRY.

This quarry is located on the Island of Talim, Laguna de Bay, distant by water 27 miles from the Bridge of Spain.

The 125-horsepower engine has given very good satisfaction during the year. No breakdowns or accidents have occurred to the same, and it has kept the mill running without the necessity of a shut down.

There are at present three crushers at the mill—one No. 6 Gates, capacity 40 tons per hour; one Austin, capacity 15 tons per hour; and one Blake, capacity 8 tons per hour.

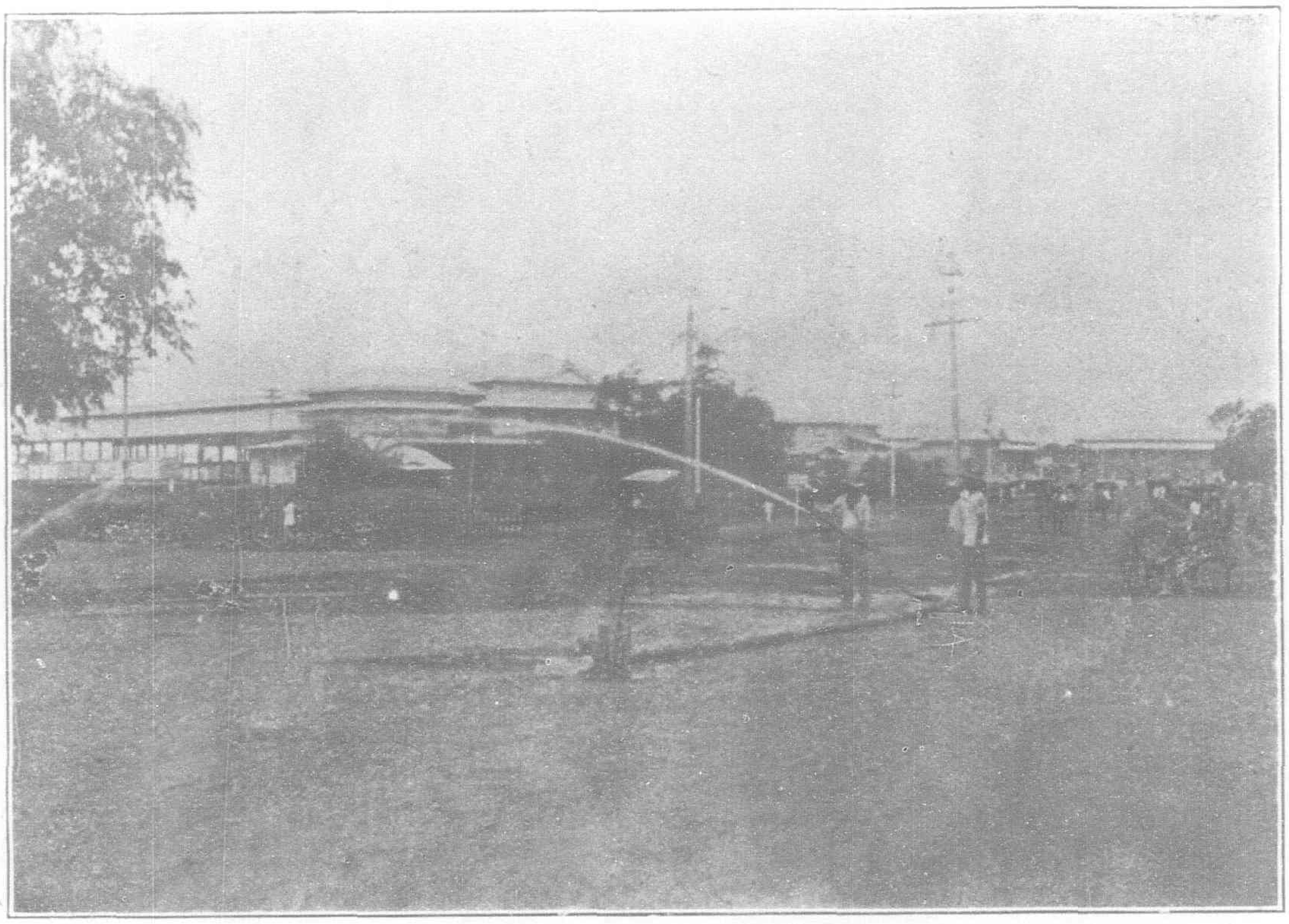
BRIDGES.

There are fifty-five bridges and seventeen culverts in the city which have been under inspection and repair during the year. Each bridge receives a thorough inspection at least once a week, thus keeping the office well informed as to the condition of each bridge and reducing the liability of accident to a minimum.

Extensive repairs have been performed on eighteen bridges and general repairs on thirty-five bridges during the year.

Summary of work performed during the year.

Streets built	square meters	18,640
Streets resurfaced	do	177,455
Streets graveled	do	124.731
Block paving relaid	do	4,485
Crossing relaid	linear meters	366
Box gutters built	do	1,602
Flagstone gutters laid	do	1,475
Concrete gutters built in place (30 centimeter)	do	3,766



STREET SPRINKLING—THE OLD WAY, WHICH IS FAST BEING SUPERSEDED.

30-centimeter cement gutter on half pipe installed	do	4,181
40-centimeter cement gutter on half pipe installed	do	325
40-centimeter cement pipe laid	do	75
30-centimeter cement pipe laid	do	52
Cement curb laid	do	8,759
Cement sidewalk laid	square meters	3,048
Street signs made	do	850
Broken stone used:		
From quarry	cubic meters	33,045
Purchased by contract	do	2,890
Gravel purchased by contract	do	10,180

STREET CLEANING, COLLECTION AND DISPOSAL OF CITY REFUSE.— This is divided into seven districts, the work of each district being performed under the direction of native foremen.

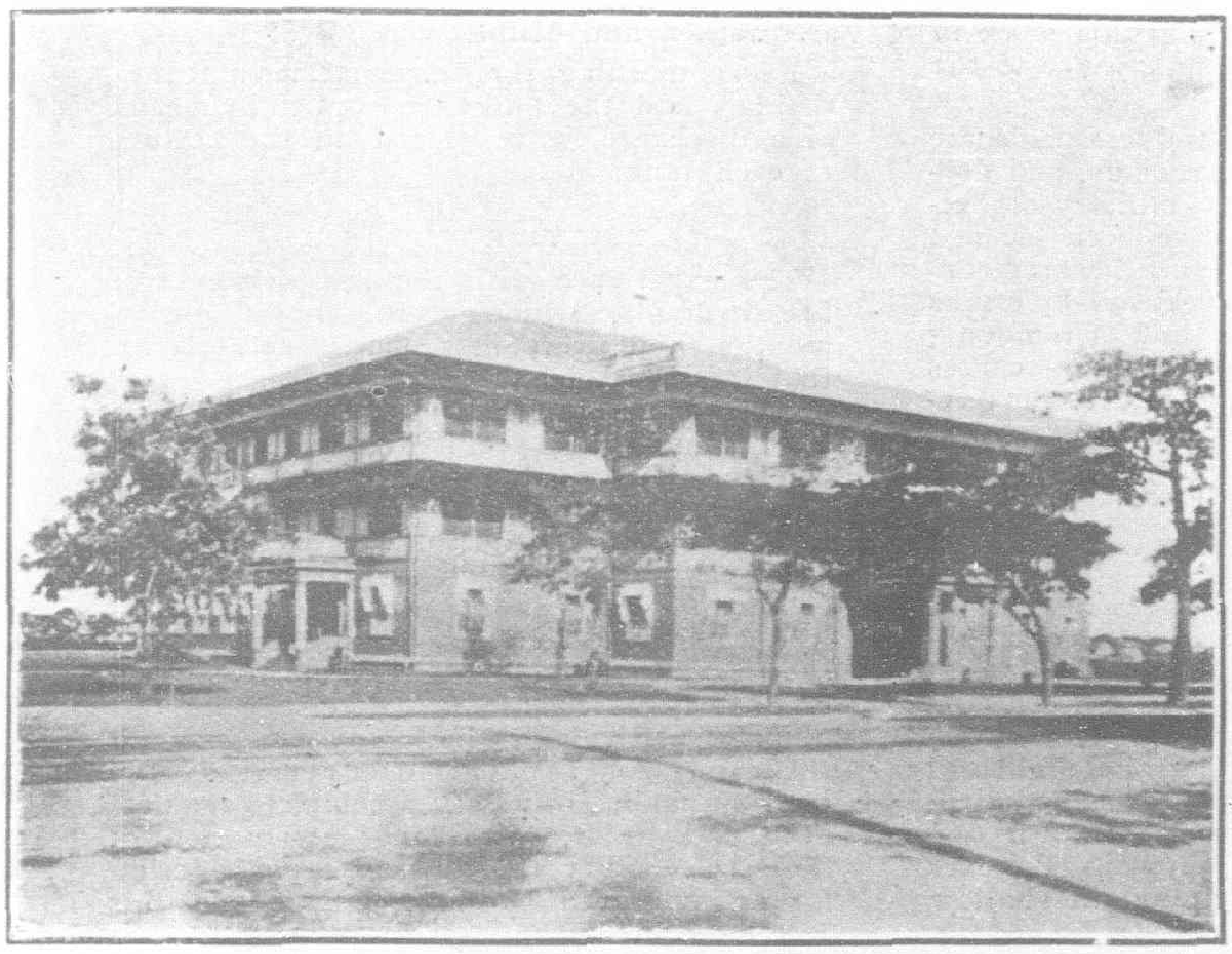
American push brooms are used for sweeping, the use of native brooms having been discontinued.

All garbage and rubbish is collected at night in carts. The collecting force is divided into seven districts, the work of each district being performed under the direction of native foremen.

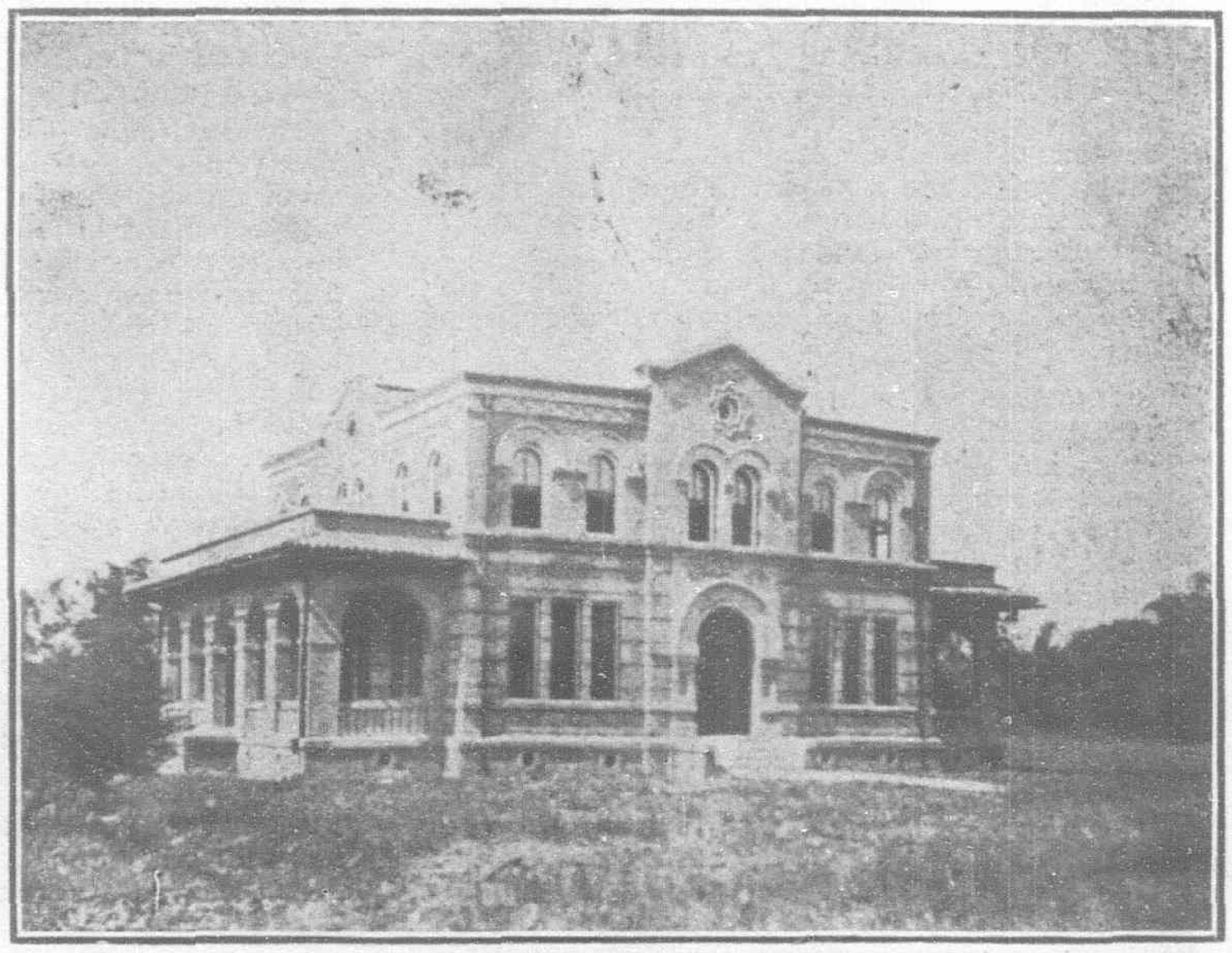
Crematories are used for burning all house garbage and such rubbish as can not be used for filling low land. The largest of these, a Morse-Bolger destructor of 120 tons' capacity, is built on Palomar Island, District of Binondo, and was placed in operation July 29, 1903.

The Paco crematory was used ten months and the Santa Cruz crematory was used two months during the fiscal year.

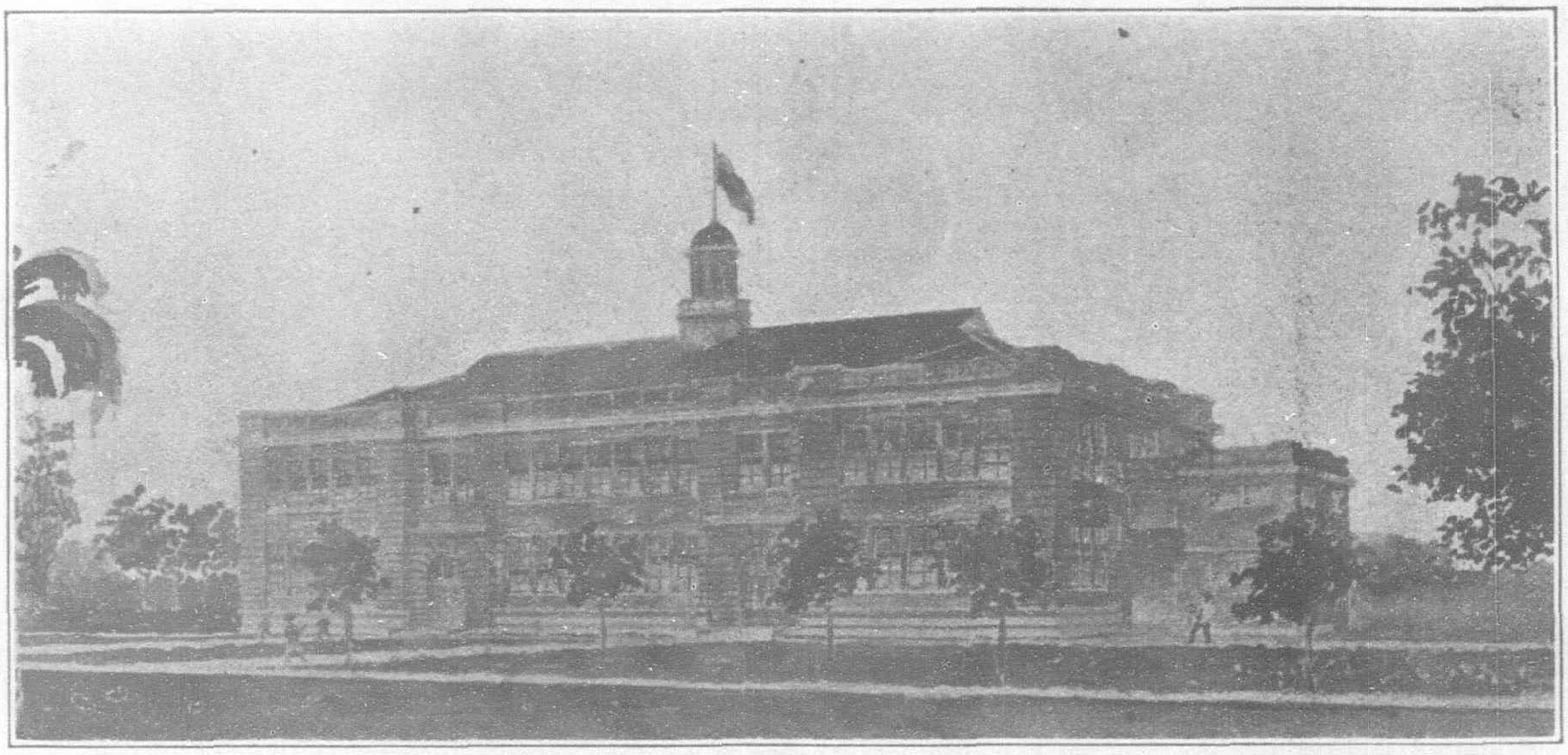
STREET SPRINKLING—THE NEW WAY.



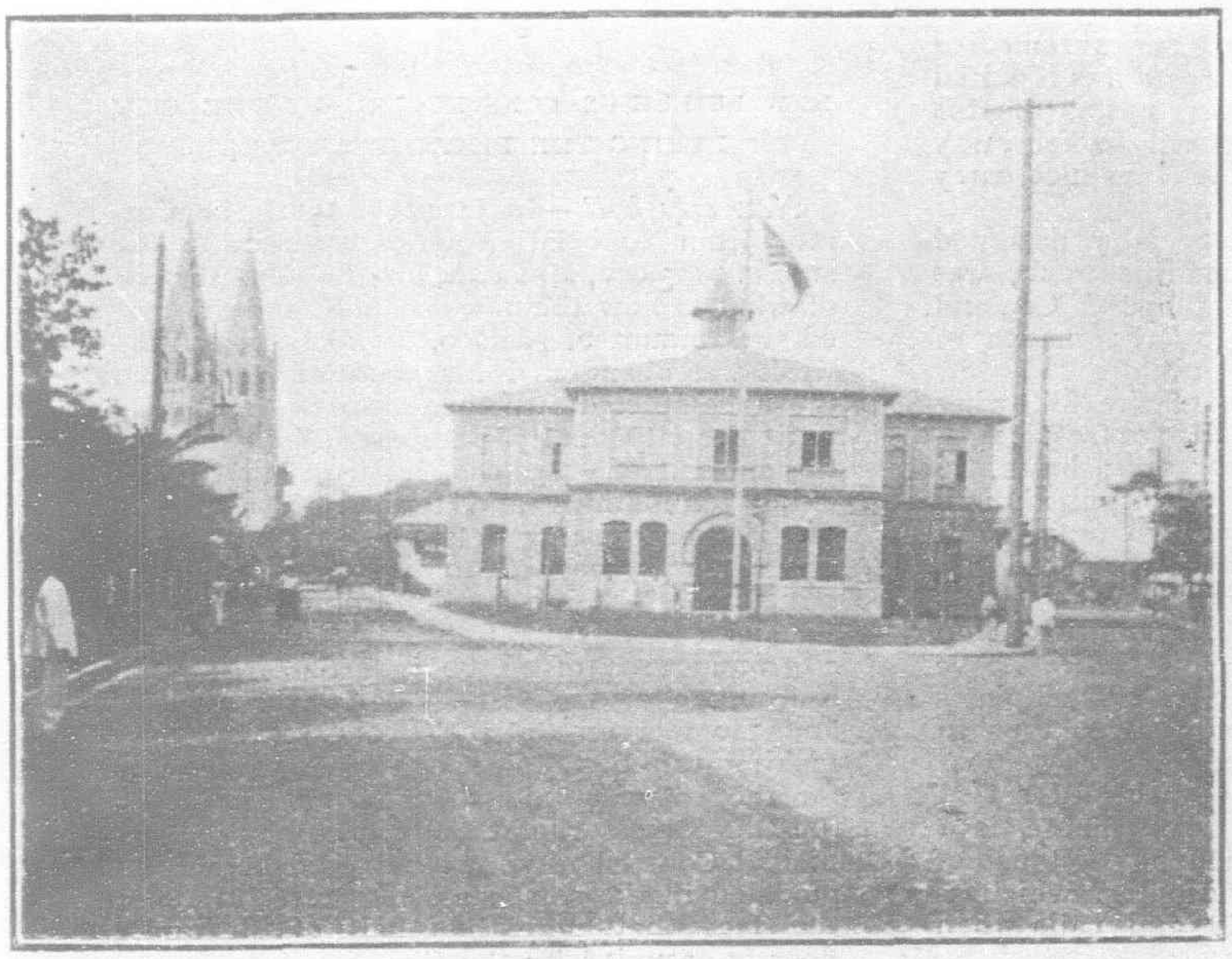
NEW TEMPORARY CITY HALL BUILDING.
(Cost -P-143,443.74 completed.)



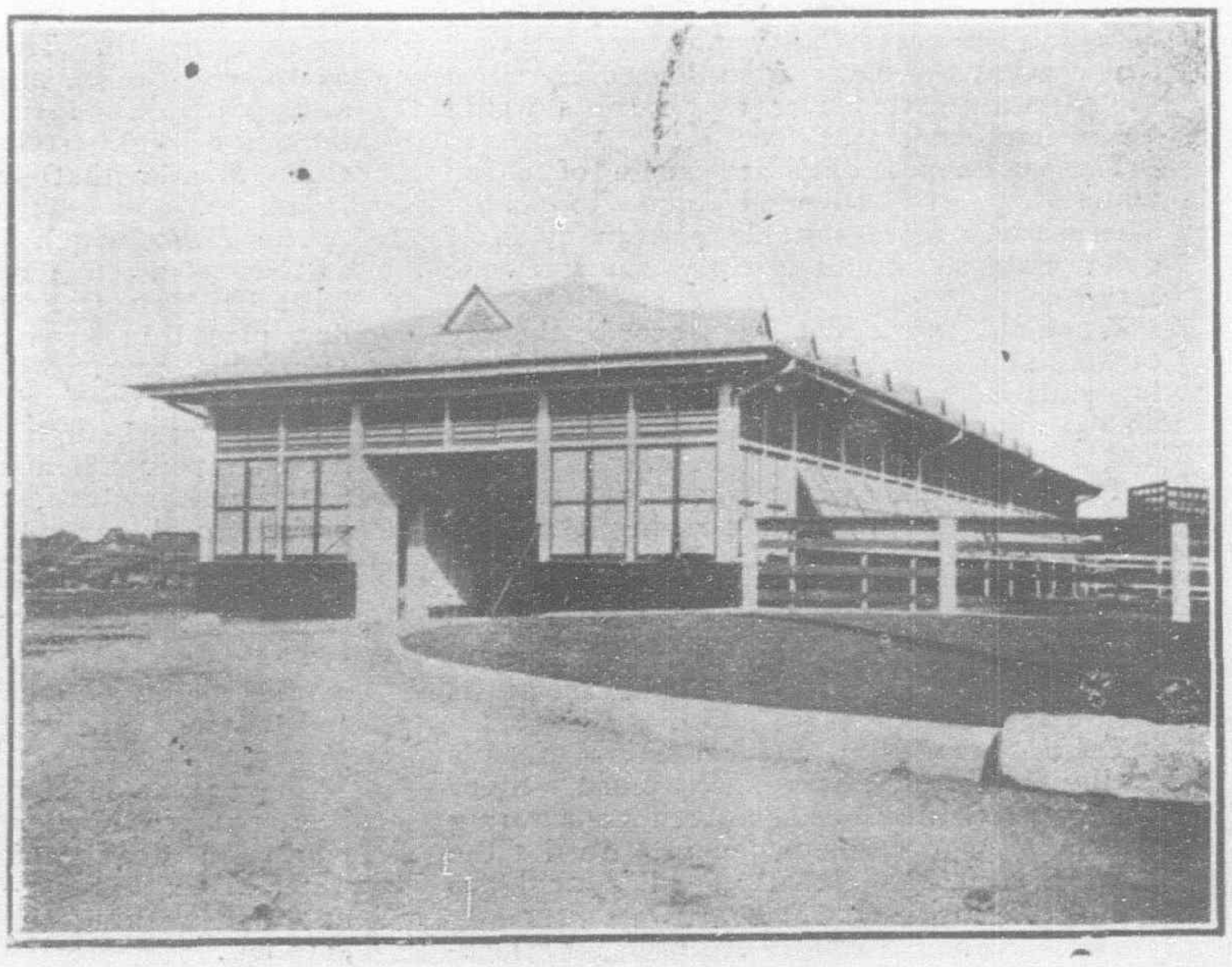
TONDO POLICE STATION.
(Cost -P-26,670.)



DRAWING OF SCHOOL BUILDING.



TANDUAY FIRE STATION.
(Cost -P-54,761.80 completed.)



VETERINARY HOSPITAL, PALOMAR ISLAND, EXTERIOR.

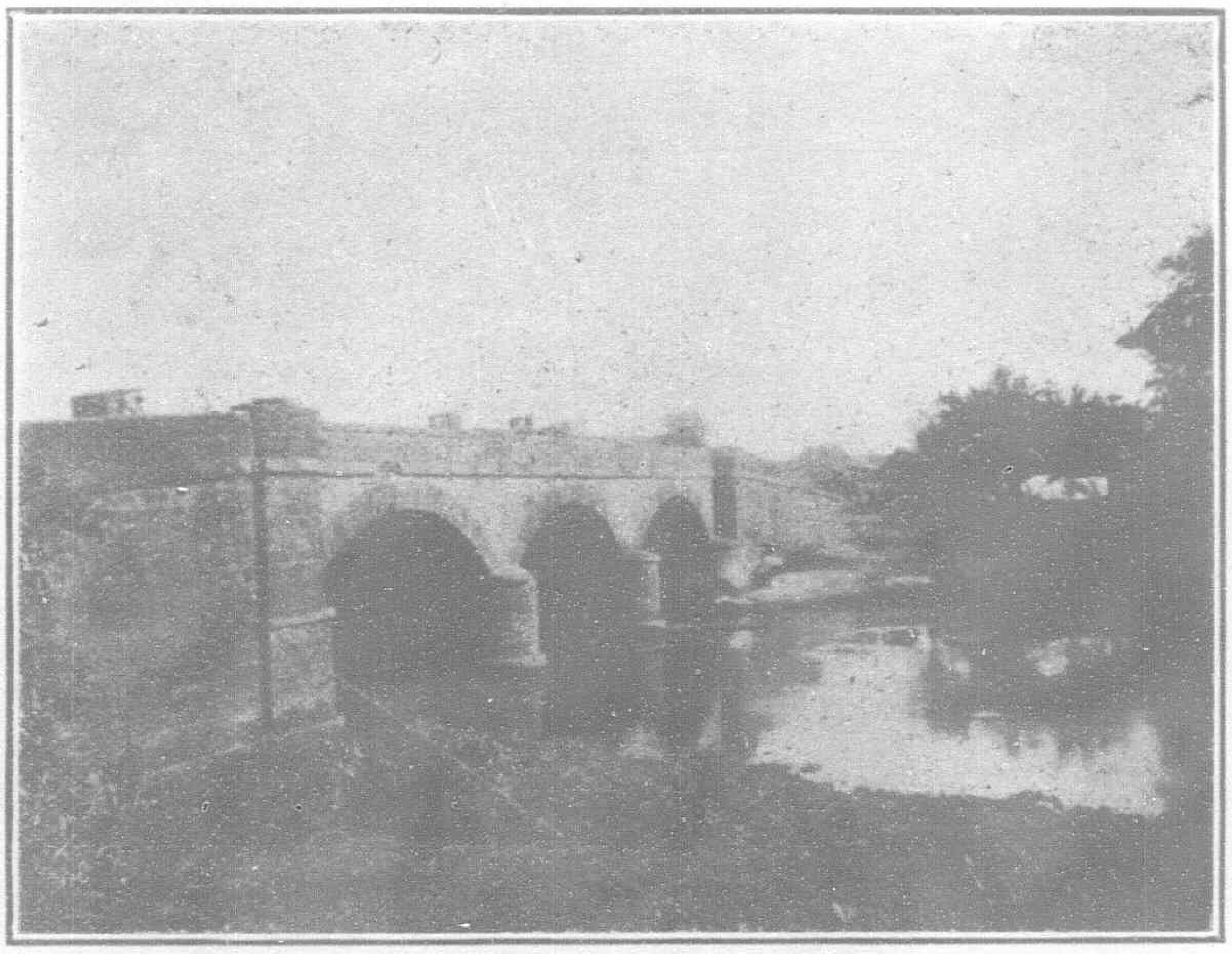
The per cent of combustible matter found in the garbage collected in the city of Manila is very small compared with the garbage collected in most cities in the United States, and for that reason a larger amount of coal is needed to consume it. Horse manure and rubbish of certain kinds are dumped into vacant lots which need filling. The use of scows for dumping garbage and refuse at sea was discontinued July 16, 1903, as this method of disposition proved expensive and unsatisfactory.

COLLECTION AND DISPOSAL OF NIGHT SOIL.

In the city of Manila night soil is collected by means of the pail-conservancy system, the odorless excavators, and the public scavengers.

The pail-conservancy system has been installed in many private houses, public buildings, and nearly all the public closets. It has proved a sanitary measure of considerable benefit to the city of Manila. Wooden pails placed in commodes are used as receptacles for the night soil. After twenty-four hours clean pails are substituted and the pails which have been used are removed, tightly covered, placed on trucks, carried to the steam barge *Pluto*, and there emptied, washed and disinfected.

BUILDING CEMENT CURB IN PLACE. (FILIPINO LABOR.)



BRIDGE AT SAN JUAN DEL MONTE.

The pails are well tarred and painted to prevent the wood from absorbing the foul contents. The covers are attached to the pails with iron handscrews. Some device for fastening the cover that would take less time and prevent the cover from loosening when the pails are carted over rough roads would be an improvement.

The commodes used are made of cheap material, poorly built, and clumsy to handle. The use of a more suitable pattern made of good material would greatly improve the service.

When this work was taken over by the city of Manila the transportation used for collecting pails consisted of 3 trucks, 7 bull carts, and 4 cascoes. This was reduced to 4 trucks and 2 cascoes on March 1, 1904.

The trucks can carry 116 pails at one time. The cascoes are used for carrying the pails by way of the esteros. This is a cheap mode of transportation, and more cascoes are available for this work when required. Public closets have been erected in districts where they are most needed, and about 470 pails are removed from these daily.

February 22, 1904, the collection of pails during the daytime was discontinued. Since that date all collections have been made during the hours of 8 p. m. to 5 a. m. April 1 the position of superintendent of pail system was abolished.

The odorless excavators are used for removing the night soil from vaults and cesspools. They consist of 500-gallon tank wagons, pumps, suction hose, etc., especially designed and constructed for performing this work in a sanitary manner without annoyance to the general public.

The contents of vaults and cesspools are also removed by public scavengers, and dry-earth closets in use by the military organization located in Manila have been cleaned by public scavengers. These are licensed contractors, who removed the night soil by means of covered barrels. This method of removing night soil is very unsatisfactory and causes much complaint. Unless the contractors provide themselves with more suitable equipment their licenses should be cancelled. The military dry-earth closets will be replaced by the pail conservancy system on the 1st of July, 1904.

When the equipment for disposing of night soil was taken over by this department February 1, 1904, it consisted of the steam barge *Pluto* and seven small cascoes. As the *Pluto* was laid up for repairs, the cascoes were used for carrying the night soil out in to the bay, where it was emptied. The public scavengers used their own cascoes for this purpose. Owing to the fact that these cascoes were emptied in shallow water within four or five miles of the Tondo beach, the tide washed the night soil up along the shore, which was very disagreeable to residents of that district and a menace to their health. This matter was remedied as soon as the steam barge *Pluto* was repaired and placed in service. By means of this boat the night soil is carried so far away from Manila that the tide does not carry it ashore.

The *Pluto*, which was especially designed and constructed for doing this work, was built by Messrs. Farnham, Boyd & Co., and first placed in service during the month of December, 1903.

It is a seagoing barge of the following dimensions: Length over all, 130 feet; length between perpendiculars, 125 feet; beam, 26 feet; depth molded, 10 feet; draft, maximum, 7 feet; coal capacity, about 50 tons; fresh water capacity, about 40 tons; speed per hour, 10 miles.

The garbage hold is fitted amidships, top of hold extending 2 feet 9 inches above molded depth and constructed of steel plates and angles, capable of holding 240 tons in 16 tanks.

The engine is compound with full set of line pumps; horsepower, 280. There is a pump on deck which pumps 30 tons of water in six and one-half minutes, which is used for washing the tanks and pails when emptied.

The night soil collected in pails, excavators, and barrels is emptied into tanks on board the *Pluto* and the pails and barrels are washed and disinfected.

Every morning the barge steams out into the bay and the tanks are emptied by means of a discharge valve placed in the bottom of each tank.

NEW FIRE HYDRANTS.

The experience with the last shipment of fire hydrants, which were almost eleven months in delivery, has conclusively shown that it is most unsatisfactory to place orders for such material in the United States. Two of the new sprinkling post hydrants were broken off near the low-lying valves in accidents, and the hydrants temporarily suppressed because no extra parts were carried in stock. These hydrants are patented articles, duplication of which in the local shops might lead to legal difficulties. It has also been shown that the present hydrants have several parts which are not necessary in this climate, particularly the low-lying valve and the drip. An accident to any part of the hydrant makes necessary a complete removal of the hydrant, with long interruption of the service. For the above reasons a design for an improved hydrant, prepared in this office, suited to the conditions in Manila, is submitted with recommendation that it be adopted for all future installations in the fire service.

NEW BUILDINGS CONSTRUCTED BY THE CITY DURING THE FISCAL YEAR 1904.

New city hall.—In January, 1901, the Cosmopolitan Association let a contract in the sum of $125,000, Mexican, for the construction of what is now the new city hall, and expended the amount of $60,000, Mexican, when the work was abandoned for want of funds, and the uncompleted structure allowed to remain until the city finally purchased the same for the amount of ₱50,000, less cost of strengthening foundations and framework necessary of the then existing defective structure. The city then proceeded to complete the construction of the present building, which consists of a three-story frame structure covering a ground area of 16,500 square feet, having a frontage of 150 feet on Calle Bagumbayan and 110 feet on Calle Concepcion, and furnishing the best office quarters in the city for the entire municipal departments, except the City Assessor and Collector and the Municipal Court, both of which could be accommodated in the same building were it not for the fact that more than half of the upper floor is occupied by the Court of Land Registration and the Register of Deeds.

The total cost of the structure as it now stands amounts to -P-143,443.74, all of which was done by contract.

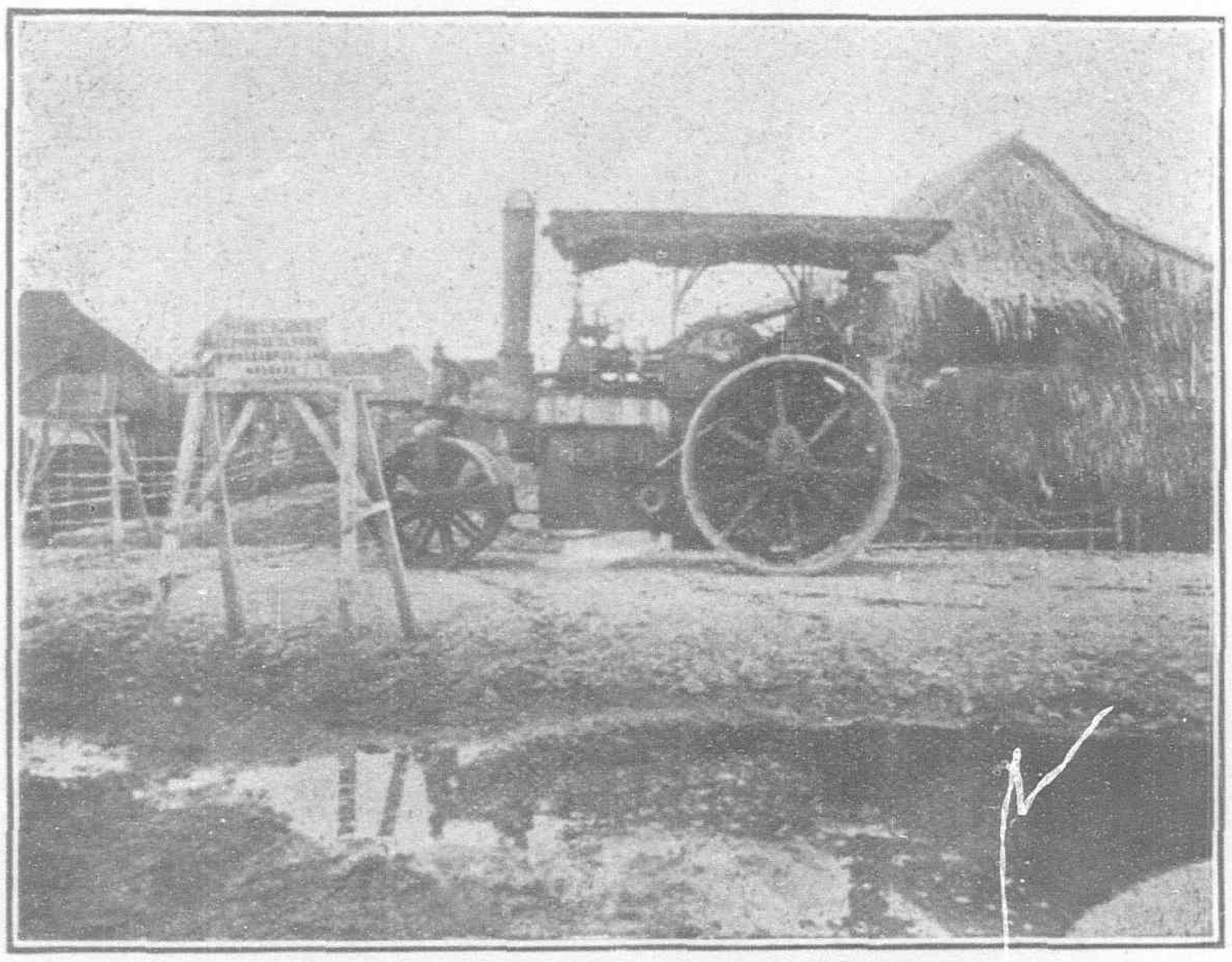
Machinery building, city shops.—This building consists of a one-story frame structure, being in size 50 by 120 feet, and was built by contract at a total cost of -P-10,534.

Veterinary hospital.—This is an up-to-date veterinary hospital, complete in every particular, and consists of a one-story frame building, covering a ground area of 35 by 140 feet; was built by contract, costing -P-10,829.83.

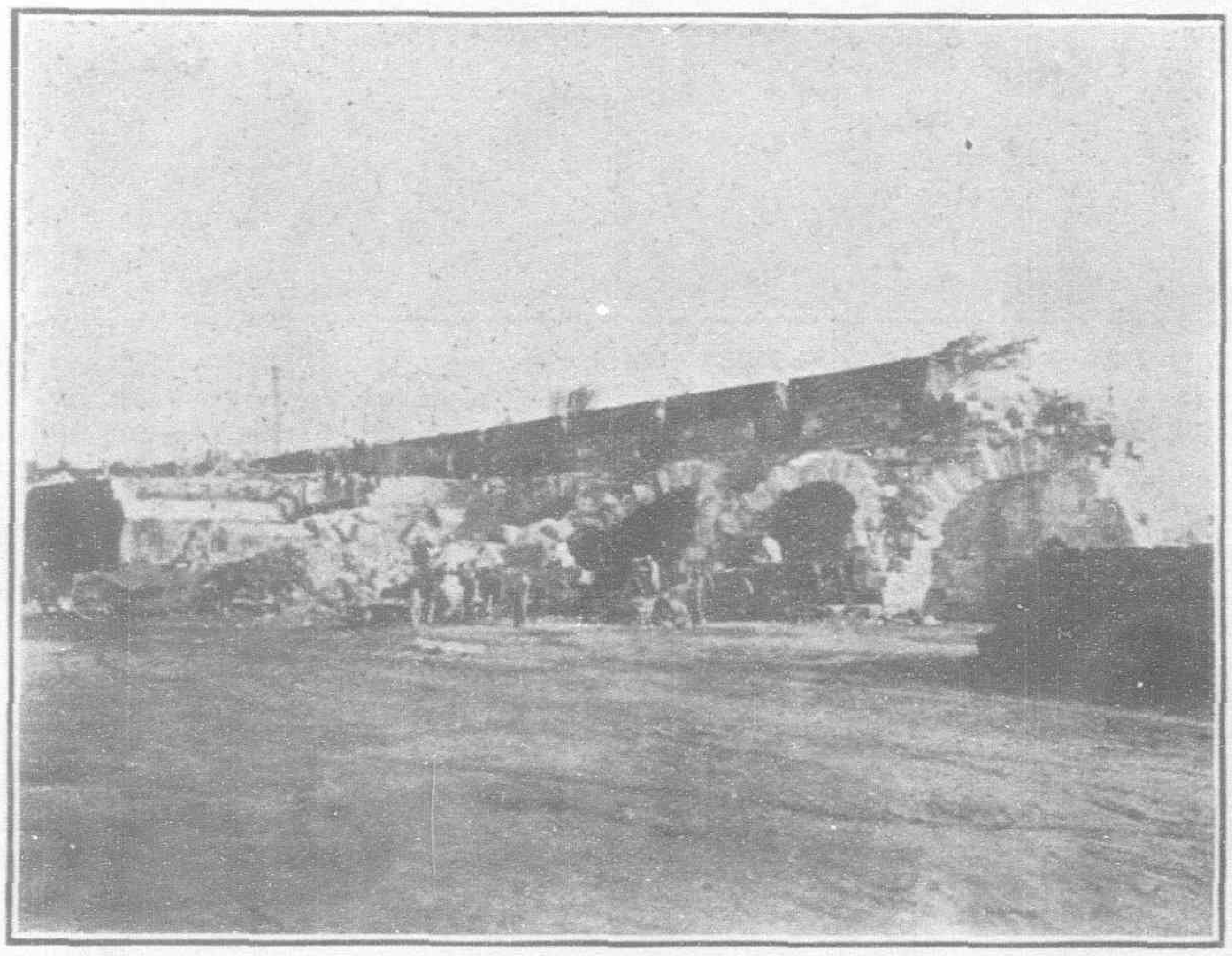
Tanduay fire station.—This is Manila's best fire station, being the most modern in design and arrangement for the purposes intended, and is a very beautiful structure, standing at the junction of Calles Concordia and Romero Aquino, District of Quiapo, The building is constructed of brick and frame, is two stories high, and covers a ground area of 61 by 78 feet. It was built by contract at a total cost of -P-54,761.30.

Road-roller shed, city shops.—This is a one-story frame building, built by contract, costing -P-1,878.

Tondo police station.—This structure is now under construction, and when completed, which will be about August 15, will give to Manila the best police quarters in the city. The building itself is of beautiful design and a substantial structure of two stories. It is built of brick with cement and tile finish, and fully equipped with modern police conveniences, such as cells and sanitary arrangements. It covers a ground area of 47 by 66 feet, situate on Calle Solis, District of Tondo. It is being built by contract, and when completed will cost -P-26,670.



STREET CONSTRUCTION—DISTRICT OF TONDO.



REMOVING OLD SPANISH WALL ALONG PASIG RIVER (PRISON LABOR) FOR PURPOSE OF OPENING UP RIVER FRONT FOR DOCKS.

Binondo band stand. — This structure is located in the center of Plaza Calderon de la Barca, District of Binondo, and is the largest band stand in the city; built by city workmen at a cost of -P-2,403.66.

Tondo fire station.—This is a two-story frame building constructed as a temporary quarters for one company in the nipa district of Tondo; built by contract at a cost of -P-3,745.

The following statement shows the cost of buildings constructed during the fiscal year 1904:

New city hall	-P-143.443.74
Machinery building, city shops	10,534 00
Veterinary hospital, Palomar	10,829 83
Tanduay fire station	54.761.30
Road-roller shed, city shops	1,878.00
Tondo police station, prior to June 30.	9,450 00
Binondo band stand	2,403.66
Tondo fire station	3,745.00
Total construction for the year	237,045.53

THE RAUB AUSTRALIAN GOLD MINES

PAHANG—FEDERATED MALAY STATES

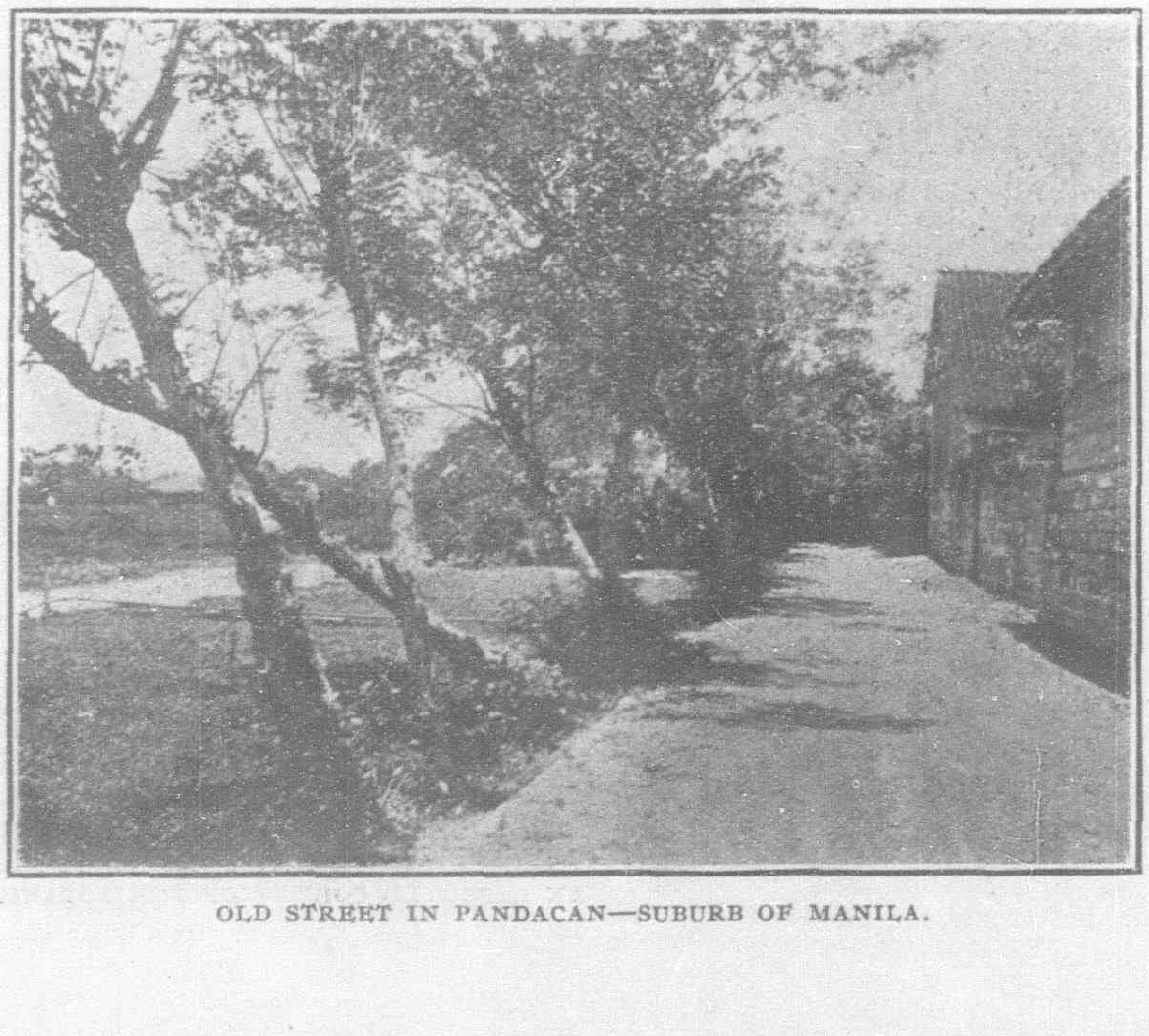
The most interesting mining property in the Far East is undoubtedly the group owned and operated by the Raub Australian Gold Mining Company., Ltd, located in the Pahang district of the Federated Malay States. Like other Eastern mining ventures it has had its ups and downs, but is finally coming to the front under the expert management of Mr. C. G. Warnford Lock, (M. I. M. M.) as one of the most promising propositions in this part of the world.

The Company has its headquarters in Brisbane, Australia, with a working branch at Singapore, but considerable stock is held throughout the Far East, where great interest is manifested in the workings and reports of the enterprise.

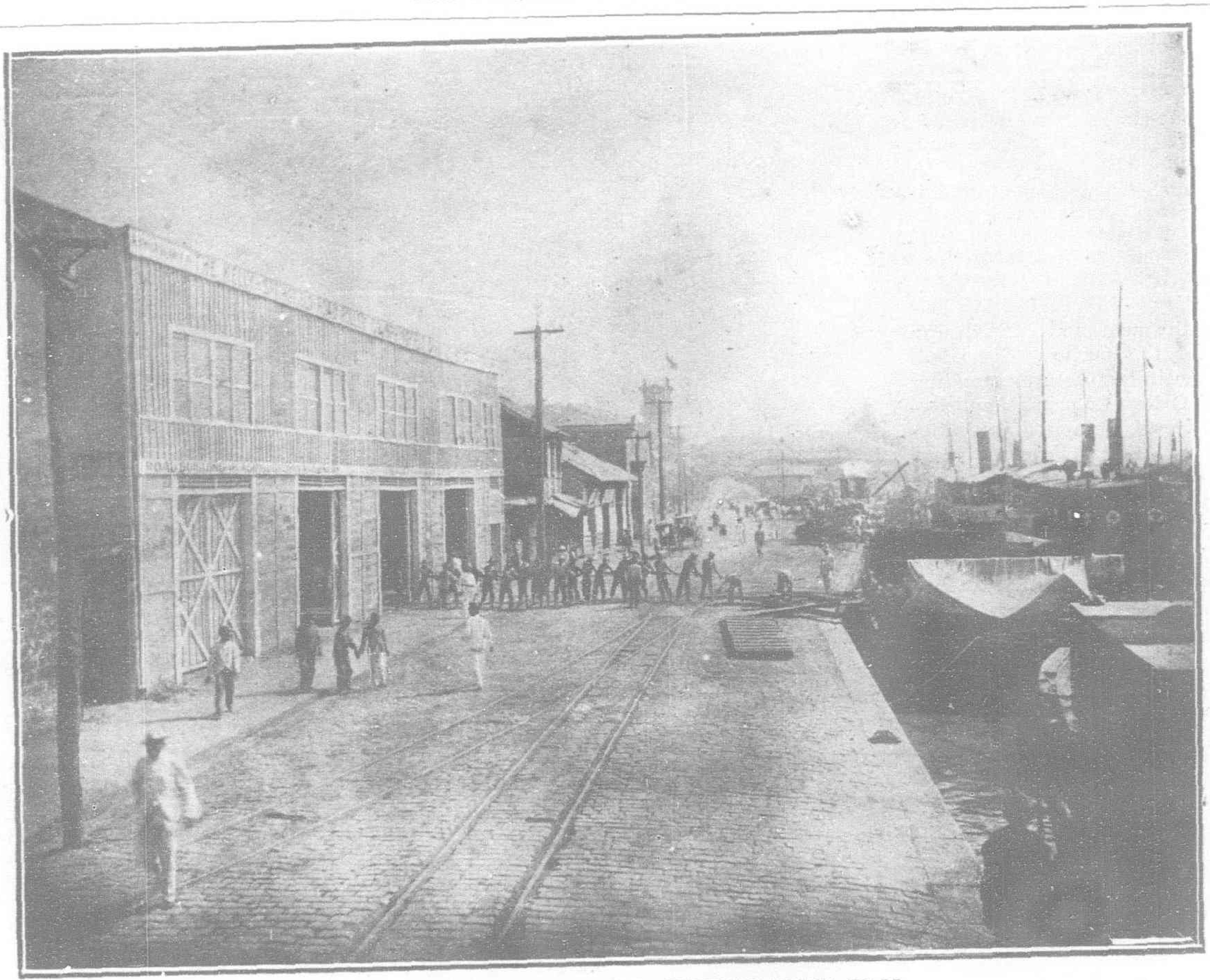
Under the present energetic management of Mr. Lock, every effort has been devoted towards developing the mines, and cheapening operating expenses by the installation of labor saving machinery.

The following extracts are from the last Annual Report of the General Manager:—

Power.—This is an all-important factor in cheap mining and milling, and one of our best assets is the Sempam generating station, which we are about to use much more extensively. In the matter of enforcing the law against dumping tin tailings into flowing streams, and



OLD STREET IN PANDACAN—SUBURB OF MANILA.



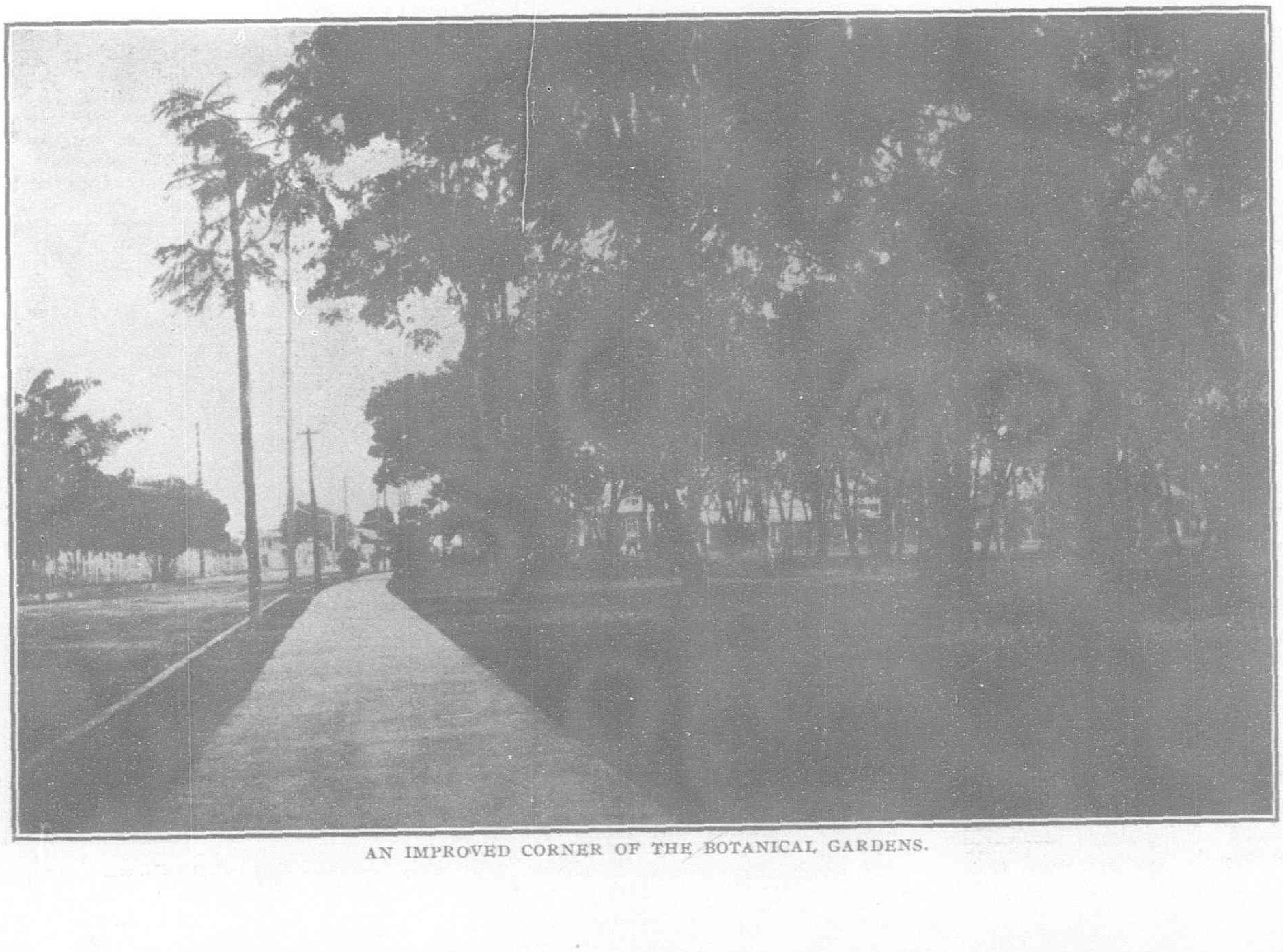
SCENE ON THE LOWER PASIG—SHOWING RIVER WALL.

providing efficient safeguards against another violation of our rights and injury to our plant, there has been great slackness on the part of the Government. Now, however, that the Government has virtually become our partner in a deep-sinking scheme, which will depend entirely on the Sempam station for its motive power, we may expect more activity. Meantime we have ourselves gone to heavy expense in improving the hydraulic part of the plant, especially in the direction of eliminating the coarse sand from the river. While this gives us bare safety, it leaves much to be done to enable us to enjoy our full rights.

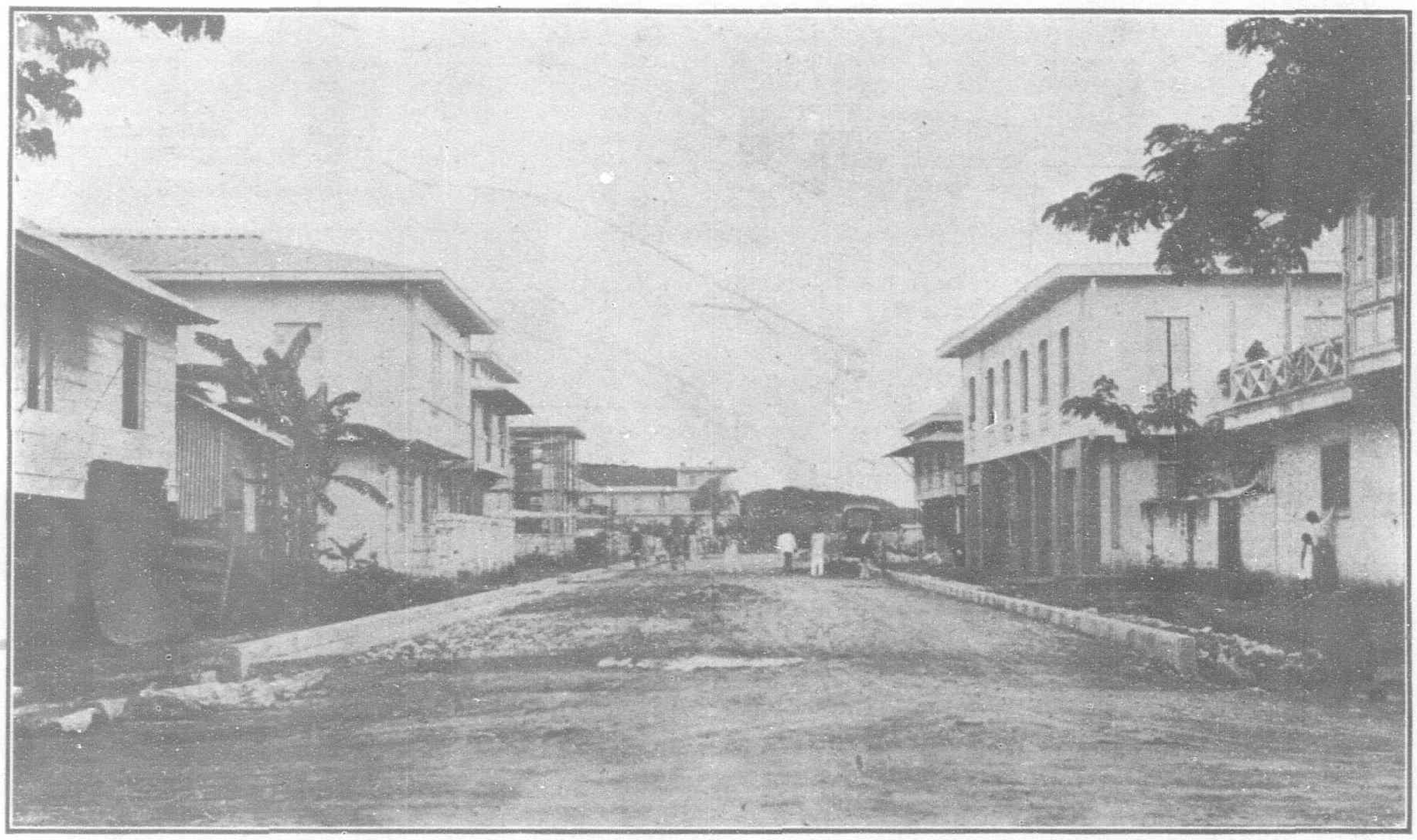
The total monthly cost of generating and transmitting electric current, including salaries, wages and stores, but not depreciation, has been about \$1,586.20. This, for an effective power transmitted of 100 h. p., works out at approximately \$16.00 per h. p. per month or £18 15s. per h. p. per annum. In this connection, it is interesting to note that the principal electric power companies in France, Italy and Switzerland sell power to consumers at prices ranging from £8 to £24 per h. p. per annum; while, on the Rand, electric power it furnished at £36, and steam power at £52 per h. p. per annum. Obviously, therefore, the running costs of our power station, though only one third of the current generated is being utilized, are distinctly reasonable.

New Main Shaft.—During the latter portion

(Continued on page 29, column 3.)



AN IMPROVED CORNER OF THE BOTANICAL GARDENS.

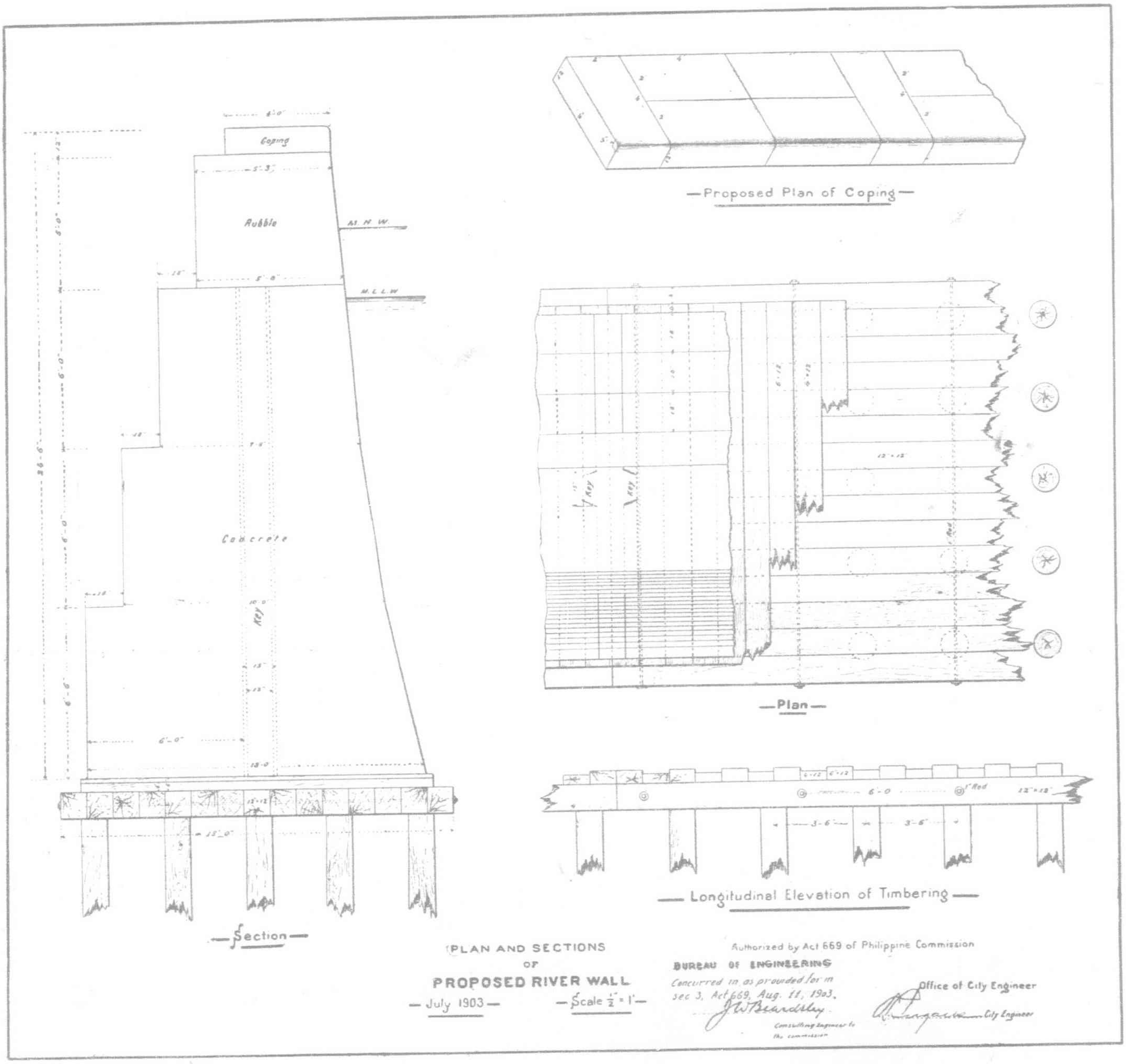


E STREET OF ERMITA EXTENSION.

BRITISH-CHINESE CORPORATION, LTD.

The sixth annual general meeting of this company was held in London at the close of the old year, Mr. W. Keswick, M. P., presiding. The chairman made the following report: "I regret that, owing to indisposition and absence from the city, some of my colleagues on the board are not with us to day, and I have also to express our disappointment that this meeting is being held later than usual, delay having been caused by the necessity of reference to China respecting certain accounts before the London books could be completed and audited. The period actually covered by the accounts shows but little revenue and the expenses more than absorb the amount received, but this result is not attributable to want of effort on the part of the directors and the agents of the corporation, but arises from the delay in concluding negotiations to enable the board to issue the loan for the Shanghai Nanking Railway in time to include the result in the period embraced in the accounts. The issue of £2,250,000, the first part of the loan of £3,250,000, was effected in July, and the board trust that, when the balance has to be put on the market, times may be more propitious and enable the corporation to place it on more advantageous terms. The protracted negotiations with the Chinese Railway Administration were, I believe, rendered more arduous and productive of vexatious delay by the possibly well-meant criticism, and sometimes hostile comments, to which the corporation's endeavors were subjected, giving encouragement to the Chinese to resist even the most obviously necessary conditions; but now that obstruction has been successfully overcome and construction of the line has been begun, I think we may look forward to work making satisfactory progress. We may also hope that in formulating final agreements in connection with the concessions we hold for other lines, what has already been achieved will smooth our way and make progress more expeditious. The Canton Railway to the Kowloon territory is receiving our active attention. The desirability of railway connection between the British colony of Hongkong and Canton is becoming very manifest, and our part in the scheme is to arrange for the financing and construction of the Chinese section from Canton to the frontier of Kowloon, where it will join a projected railway through British territory. We have every reason to hope the agreements that are necessary will not be long delayed. Now with regard to the financial result of the placing of the loan I have referred to—the Shanghai-Nanking Railway issue—through the Hongkong and Shanghai Banking Corporation, the remuneration obtained for our services will be from a commission on the purchase of material for the railway, which will be an annual source of revenue, and there will also be whatever profit is shown on the loan after the charges connected with it have been met. You are aware that the corporation took the loan at a discount which, it was assumed, would secure a fair return, but circumstances rendered the flotation less favorable than was looked for, and I may give as an estimate about £25,000 as the sum that will be realized upon the amount of loan already placed. In order to render the issue more attractive at a time when it did not present much inducement to the public, the corporation which was entitled to receive certificates to represent prospective profits, gave them up to the bondholders, indeed, it was considered necessary to do so to secure the successful issue of the loan. In our next accounts the financial results will appear. The scrip of the loan which went to a discount on issue has, I am glad to notice, hardened since, and it would appear that confidence in Chinese securities is disposed to increase, in which case we shall find further issue less difficult and more remunerative.

"The service of the Northern Railway loan which we issued in 1899 has never failed, even during the Boxer rising, and the occupation of the railway by the Powers, and punctually each month the amount required is paid to the Hongkong and Shanghai Bank. Judging from the improvement in the price, the merits of the bonds appear to be appreciated, and I do not think the courageous investor at the panic price in 1900 of 72, whom I heartily congratulate, will ever get a like chance again. The Peking-Tientsin-Shanhaikwan section of the railway, that is the portion within the Wall which is less than half the entire railway, has had, and has been able to bear the brunt of working the entire railway and the service of the loan, as owing to the Boxer troubles and the blighting and paralysing nature of the Russian occupation of the extra-mural portion of the line and of the country it was destined to serve, the extra-mural section has never had the amount of traffic which would otherwise have undoubtedly come to it. For some time past, however, the earnings have, I understand, been improving. Amortisation of the loan commences next year, when one-fortieth part of the bonds will be drawn annually for redemption. I ought to add that the corporation on behalf of the railway and in the interests of the bondholders formulated a claim of upwards of £400,000 against the Chinese Government for the damage suffered by the railway during the Boxer rising. And it is right and due to our Foreign Office that I should mention that, recognizing that the claim affected the bondholder's security, action was taken which resulted in the inclusion of the claim in that of the British Government on the Chinese Government. The corporation through its agents has also been called upon to render extensive service in establishing and getting paid what are known as the private claims, viz., those of railway employees and many others, which claims have now all been paid, leaving only for settlement the railway claim, which will probably be liquidated by instalments being handed to the railway administration as collected from the Chinese Government. From previous reports you are aware that we consider we have a valuable asset in the Nanpiao Coal Concession, of which we are actual half owners on bedrock terms with the Imperial Railway Administration. The property has been reported upon at different times by three first-class British engineers in the most favorable terms, and the prospecting indicates the existence of coal of excellent quality and in vast quantity. The colliery expert referred to in the report, after an exhaustive investigation, estimates that for less than £200,000. of which our share will be one half, a first-class colliery can be laid out to deliver coal at a cost upon which, his inquiries show, a very handsome profit can be made. The development of this asset which we propose to effect by a separate company, as mentioned in the report, is our immediate business in the North of China. With these remarks I think I have put before you the exact position in which the corporation stands. We have a very valuable property in the colliery, and as soon as possible it is our intention that that asset shall be developed to the full."



PASIG RIVER WALL

Under Act No. 669 of the United States Philippine Commission plans were prepared and the contract awarded for the construction of a concrete retaining wall along a portion of the south bank of the Pasig River, south of the Bridge of Spain, and under Act No. 1904, which provided $30,000, United States currency, the work has been commenced.

The amount expended to June 30, 1904, was $12,366.25, United States currency, leaving a balance on hand of $17,633.75, United States currency.

The work consists in the construction of a wall, approximately 1,000 feet in length, constructed of concrete with stone coping, resting on a grillage and pile foundation of sufficient depth to allow an 18-foot channel at low water.

The old city wall is being removed along this portion of the river, and in addition an area of approximately 7,600 square meters will be reclaimed by filling out to the new wall.

The construction of this wall opens up a section of river front not heretofore available for commerce and will greatly facilitate the handling of the inter-island freight.

The following table shows the engineering force employed in the improvement of river front and construction of river wall:

Position.	Number.	Salary.	Remarks.
Engineer in charge..........	1	-P-3,600	American.
Inspector......................	1	2,000	Do.
Rodman.......................	1	1,800	Do.

AMERICAN ASSOCIATION OF CHINA.

Makes Vigorous Protest Against the New Mining Regulations.

At the annual meeting of the American Association of China held recently in the rooms of the Chamber of Commerce of Shanghai, the President, Mr. J. N. Jameson, presided. Professor Jeremiah W. Jenks, United States Monetary Commissioner to China, was chosen an honorary member of the Association in appreciation of his excellent services in bringing about a reform of the currency of the Empire.

The following gentlemen were elected members of the Executive Committee for the year 1905: Messrs. C. C. Baldwin, S. Fessenden, C. E. Fiske, A. S. Fobes, P. W. Irvine, J. N. Jameson, C. S. Leavenworth, C. S. F. Lincoln, A. P. Parker, Gilbert Reid, and Murray Warner.

The following gentlemen were elected officers for the current term: President, J. N. Jameson (reelected); Vice-President, Murray Warner (reelected); Honorary Secretary, C. S. Leavenworth (reelected); Treasurer, P. W. Irvine (reelected).

Mr. Leavenworth read the report of the Executive Committee for 1904, which had this to say about Americans in the Orient:

"Americans in the Far East—who are so far away from home and are obliged to mingle in the active business affairs of the day, when all other nationalities are hard at work—even on our national holidays, sometimes perhaps, tend to lose sight of what these days stand for in our history. In order to keep in touch with the commemoration days of the Great Republic, we can show our patriotism by a liberal display of flags and bunting on these days, and likewise by taking a little time from the pressing needs of business to attend the set services of the occasion. It has been the desire of the Committee to pay special attention to this felt need in our life out here."

The Committee referred to the awakening of China, with special notice of mining regulations, in the following language:

"The evidence of the awakening of China to a real interest in the commercial and industrial life of the world is most gratifying, and her desire to prepare definite regulations by which the new activities may be guided, is very laudable. However, as a great American President once said, a man who never makes mistakes never makes anything, and so China, in the new and complex field upon which she has entered, can not help but make some errors of judgment, which will doubtless be speedily rectified. Thus, the guiding principle of the new arrangements made for the opening of mines appears to be, at any rate to the foreign observer, a desire to shut out foreign advice as much as possible. Now, while recognizing China's sovereign rights in all these matters and the great danger of the effect of unprincipled foreign adventure, by which interested parties may try to get control of the resources of China for their own selfish advantage, yet it is manifestly visionary for China to shut out foreign capital and foreign advice in toto, for she is not in a position to develop her own resources entirely alone and by herself, and will find in time, as all other countries have done, that it is necessary to welcome foreign capital, to an extent at least. It is, therefore, in a spirit of the greatest friendship towards China herself that your Committee has joined in certain measures in regard to the new regulations."

With reference to the action of the American Minister at Peking in filing a general protest against the new Mining Regulations and the "Regulations of the Mining Syndicate of the Province of Hunan," the Committee expressed itself in accord with the step taken. On this subject it said:

"The 'Regulations of the Mining Syndicate of the Province of Hunan'...... also exhibited this same spirit of a desire entirely to prevent foreign capital from helping China. Your Committee seemed justified in considering that, since foreigners were prohibited from holding shares in the Syndicate, this was a matter of importance to all Americans in China, as a far-reaching precedent not to be agreed to for one moment, for, on reading the terms of the concession, in connection with Article VII of the American Treaty, which was ratified in January of 1904 between the United States and China, your Committee was forced to conclude that the provisions of that Treaty had been wholly ignored. By correspondence with the American Consul General at Shanghai, the Committee was informed that the protest, which it had made in regard to the Hunan Mining Regulations, had been transmitted to the American Minister at Peking and that in reply Mr. Conger had said that these regulations undoubtedly violated the provisions of our Treaty and that he, as well as other diplomatic representatives, had made a strong protest against them."

TACHIN RAILWAY SIAM

According to a recent issue of the Siam *Free Press* there was a big assemblage at the Bangkok station of the Tachin Railway Company, Limited, on the morning of January 4th, when the last spike of the line was driven by His Royal Highness the Crown Prince, and the new road by him formally declared open. For an hour or so before the advertised time of the ceremony a flotilla of steam launches was kept busy transporting people across the river to the railway station, which had been neatly if not elaborately prepared for the occasion.

Shortly after 8:30 a. m. the guard of honor lining the causeway from the station to the pier presented arms and the bugle announced the approach of H. R. H. the Crown Prince and suite, comprising the following: Prince Nakon Sawan, R. S. N.; Phra Burendz, Phya Vahlaoh, Phya Bumroenbhakdi, Luang Abhiraks and others. Upon arrival at the dais erected in the centre of the main platform, His Royal Highness was addressed by H. E. Phya Phipat Kosa, who explained the aims and objects of the line, the constitution of the company and other matters. His Royal Highness then replied at length, partly in Siamese and partly in English, wishing success to railway enterprise of all kinds in Siam, whether inaugurated by the public or by the government.

The speeches having been concluded, Mr. P. B. C. Kinch stepped forward and adjusted the customary final spike, which his Royal Highness at once commenced to hammer into its underlying sleeper in first-class professional style. Then an adjournment was made to the station buildings at the rear of the platform where the prosperity of the new concern was toasted in champagne and refreshments of all kinds were handed round. After a particularly pleasurable social time of it the signal "all aboard" was sounded and the numerous guests took their places in the comfortable and handsomely appointed carriages, and the first train to run over the whole 33 kilometres of line started, accomplishing the distance in the highly respectable time of one hour and ten minutes, the highest speed being attained throughout being 45 kilometres per hour, which was kept up over a stretch of 19 kilometres.

For a new line there was a wonderful absence of "wobbling," either in the car next to the engine or in a light ballast truck at the extreme "stern" of the train. The line for the first few miles after leaving Bangkok leads through a wonderful succession of fruit gardens and through a district affording abundant evidence of a thorough prosperity. But before the half distance is reached the view on both sides of the railway changes and it leads through an apparently interminable swamp until within a few miles of Tachin, where human habitations and squares of paddy begin to assert themselves. From the Tachin station a siding leads to a pier on the Tachin River at its junction with the big klong which leads to it from the Menam at Bangkok. The river here broadens out almost like a lake and the scene is decidedly picturesque and was much admired by those who took the trouble to walk to the river bank. At Tachin refreshments were much to the fore and were generally appreciated. The return journey was merry if uneventful. One or two of the more important stations were stopped at and as a result a few daring peasants of both sexes got free rides to town on the unaccustomed *rua fai*, which they seemed much to appreciate. At a few minutes past noon the train glided into the Bangkok terminus, no mishap whatever having occurred to mar the pleasure of what proved to the guests a most pleasant outing as well as a trip replete with interest and instruction.

The Tachin Railway is 33 kilometres long and constructed on the 1-metre gauge. In its laying out quite a new plan has been followed, so far as Siam is concerned, in the fact that in place of numerous transverse "sleepers" or "ties" the rails are embedded in concrete along their entire length, each 9-metre rail length having three transverse sleepers and four iron braces to prevent it it from side motion. This, judging from results, is most successful and the rails seem as though embedded in the solid rock. At present the company possesses two locomotives, each weighing 16 tons and with a maximum speed of 45 kilometres per hour. The carriages are all neatly and handsomely built and finished, their lower parts coming from Europe and the woodwork and fittings from the hands of Mr. Fook Loong, the well-known Bangkok contractor. One particularly handsome carriage has been constructed especially for the use of the King. It is prettily upholstered in white silk and possesses excellent lavatory accommodation, etc. Among the more important engineering works on the line must be included the bridge over Klong Ban Nam Chuan, about half way to Tachin and an important market centre. Otherwise the line possesses no particularly striking features—that is, if we except a stretch, perfectly straight, extending across the alluvial plain for 19 kilometres. There are seven intermediate stations along the line of route and judging from all appearances the shareholders should regard the Ticals 1,100,000 which they have disbursed as money well and wisely invested.

DIAMOND DISCOVERIES IN BORNEO

Expert agents of the British North Borneo Company having confirmed the discovery of diamond clay somewhere up the Labuk River, in the insular territory controlled by the British corporation, the effect in England has been bordering on the sensational. Share buyers and adventurers alike have fixed their attention on the company's holdings. Borneo has always been classed as a diamond-producing country, but the supply was long ago believed to have been exhausted. A brochure on diamonds, published about fifty years ago, mentions that "the Island of Borneo is the only other eastern locality which can boast of its (diamond) production. The diamond occurs at Pontiana, in that island, directly under the line, and at Benjarmassin, about three degrees south of the equator. Here it is said to be of a quality superior to that of the gems found in the other Indian localities; and to be distinguished in consequence by the name of *Landak*, the place where they are found. Here also the diamond occurs in alluvial soil, accompanied with gold."

ENGINEERING SOCIETY OF SIAM

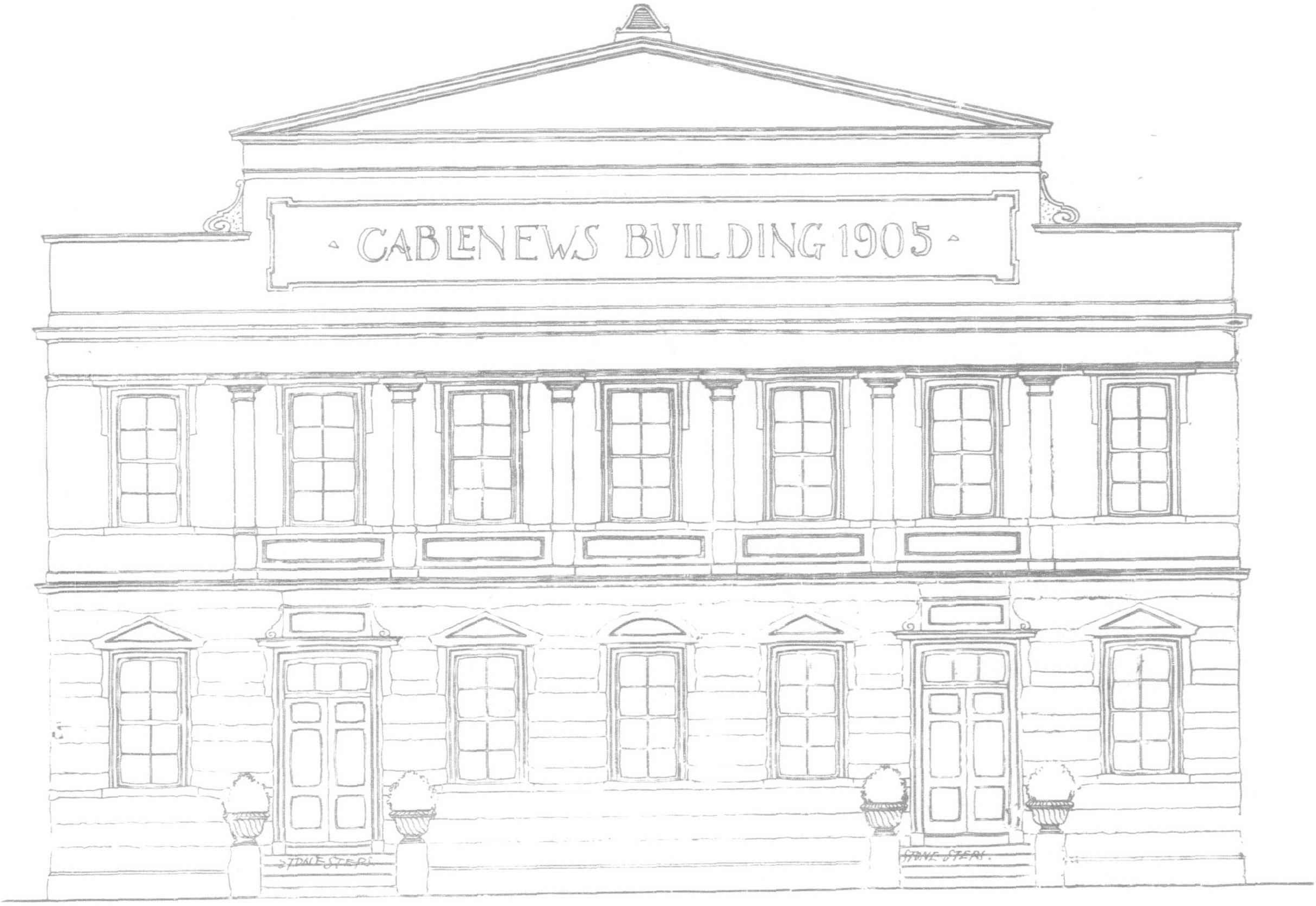
A new organization having for its purpose the association of engineers for the advancement of mutual interests has just been organized in Siam. It carries the name of the Engineering Society of Siam, and gives promise of being a strong and useful adjunct to the development of the country. The objects of the association are "to promote the science and practice of all branches of industry—engineering, mining, building, architecture, etc.—and to facilitate the interchange of ideas respecting local and general engineering questions, by means of papers, discussions, publications and the like; to establish a reading room and reference library; to help in these and other indirect ways in developing the industries of Siam."

ICE PLANTS NEEDED

According to Mr. George E. Anderson, American Consul at Hangchow, China, in that city of something like 1,000,000 people there is not a single ice plant, although the demand for ice is constantly increasing. During the summer months some of the large fish merchants have ice brought with fish stocks from Ningpo, where it has been secured from the north during the winter. It is proposed that the large cotton factory there utilize some of its property for an ice plant in connection with its other work, and the factory authorities are said to be about ready to close with Shanghai agents of a foreign firm for the equipment. There is room for a large independent plant at once, however, and the situation there is no different from what it is in four or five other cities in this consular district, not to mention the rest of China. Pending the establishing of public ice plants in the cities of this part of China, there is a demand for information as to small plants for household or community use. The whole trade, he says, ought to be pushed.

MALAY EXPLORATION SYNDICATE

A new company just registered in London is called the Malay Exploration Syndicate, Limited, and has a capital of £20,000 in £1 shares. The object is to adopt an agreement with the Pahang Corporation, Limited, and the Pahang Kabang, Limited, to acquire lands, rights, mines, etc., and property in the territories of the Sultan of Pahang, or elsewhere in the Malay Peninsula or archipelago, and to carry on the business of planters and cultivators of and dealers in agricultural products; explorers and prospectors for minerals; timber and lumber merchants, sawmill owners, miners, etc. The first directors are Messrs. H. W. Thomson, H. Frisby, and J. A. Bell.



NEW CABLENEWS BUILDING

MR. ISRAEL PUTNAM SOON TO ERECT A SPLENDID PUBLICATION STRUCTURE.

An example in enterprise for the commercial community of the city to emulate has been set by *The Manila Cablenews* in its new building, which will shortly be begun on Calle Nueva, District of Ermita, as yet a residential and club section of the municipality, but the recognized pivotal point upon which much of the future business growth will turn. The new harbor works, when completed, will place the Cablenews building within a stone's throw of the waterfront and custom house. The hotel project, now under consideration by the Commission, is assuming tangible form, and there is every reason to believe the proposed $500,000 hotel for Manila will shortly become an assured fact, and that it will be located just off the Luneta and within less than five minutes' walk of the Cablenews building. From a publishing and editorial standpoint the site chosen for the first modern newspaper building to be erected in this part of the Orient could not be excelled. It is within easy reach of all the insular and municipal offices.

The Cablenews building is to be constructed of concrete on expanded metal. The superstructure will be partly steel and partly of hard wood. Expanded metal lathing will be used throughout the building, which, when finished, will be practically indestructible by fire. The interior will be lathed and plastered. The exterior will be finished in a light granite color and will be ornamental, as shown by the accompanying illustration.

The entire lower floor of the building will be devoted to *The Manila Cablenews* itself. There will be two entrances, one to the business offices and the other to the editorial department. The business office will be exceptionally large, finished in hardwood and handsomely decorated. There will be a large manager's office connecting with the city room, and back of this will be the composing room, extending the entire width of the building. Adjoining the composing room will be the art and stereotyping department. The press room will be in a separate building in the rear connecting with the composing room by a covered passage way. In this pressroom will be installed the two duplex presses with their electric motor and auxiliary oil engine. Connected with the pressroom will be the circulating department. The lower floor of the main building will also contain a large storeroom for paper and other supplies. There will, of course, be extensive toilets for the use of employees of the paper.

High class apartments will be established in the second story of the building. They will be entirely up-to-date and may be occupied singly or *en suite*. The best class of plumbing will be installed and there will be public and private baths, toilets, etc. The equipment of these apartments will include all the accessories necessary for comfort in the tropics.

To the enterprise of Mr. Israel Putnam, founder of *The Manila Cablenews*, is due this splendid new building.

EXHIBITION OF AGRICULTURAL IMPLEMENTS

Mr. Welborn, Chief of the Philippine Bureau of Agriculture, gave a practical exhibition of the working of modern American agricultural implements which have been furnished to the Government by Mr. C. E. Helvie, representing the Kelly-Springfield people here, for the benefit of a number of influential Filipinos, on the experimental farm at Murcia, one day about the 1st of February. Among the natives present were Civil Commissioners Legarda and Tavera, the editors of the leading Filipino newspapers of Manila, and a large number of wealthy and influential farmers. At the conclusion of the tests the opinion was unanimously expressed that the introduction of the modern implements of agriculture into the Philippines marks a new era in farming and assures the rejuvenation on an elaborate scale of agriculture in the archipelago. The tests included plowing hard clay, soft swampy places, and soil completely overgrown with weeds and vegetation. The great plow hauled by a 33-horse-power traction engine simply walked through all osbtacles and covered them up completely in the deep furrows. Tests were also made of rice-threshing machines, twine-binders, and other implements with which all first-class farms in America are equipped with these days. The Civil Commissioners were so highly delighted with the result of the exhibition that they immediately sent the following cable message to Secretary of War Taft, at Washington:

"We are requested by agricultural interests to urge that rice-threshing machines and steam plows be not classed with traction engines and locomotives at 15 per cent *ad valorem*. The tax will make duty prohibitive and in view of the dearth of carabaos, these machines are the only salvation of agriculture in the Philippines."

Both of the Filipino Commissioners talked enthusiastically about the exhibition afterwards. They maintained that properly supplied with modern agricultural machinery the Philippines are capable of exporting the products of the soil instead of importing them, and they expect to see them doing so in the near future.

"But dependence can no longer be placed on the carabao," said Commissioner Tavera. "The only solution of making the Islands self-supporting lies in the introduction of American agricultural machinery. The area now under cultivation is not more than one-half of that which produced in Spanish times, but with modern methods applied what has been lost can easily be regained, and much more in addition to that."

In connection with his tests Chief Welborn said the exhibition demonstrated that one steam plow or 35-horse-power will do as much work in one day as the combined labor of 240 men and 480 carabao, and the results accomplished can not be compared with the crude work performed by the native plow.

CONSULAR REPORT, FOOCHOW, 1903

Mr. Brady, American Consul at Foochow, in his report for 1903 to the Washington Government, only recently made public, says there is but little demand at that port for foreign machinery. About half the entire import, which amounted in value to only *Hk. Tls.* 84,798 (£11,174), was for Government purposes, chiefly for the arsenal and the mint, and the remainder for the two or three factories run by foreigners. Native industrial activity is not yet sufficiently developed to require machinery. Two foreign-owned sawmills, one British and the other German, provided with modern machinery have been in operation for a number of years past, and appear to be doing a prosperous business, if one may judge by the returns, which show an increase from *Hk. Tls.* 14,284 in 1899 to *Hk. Tls.* 52,315 in 1903. Their chief business is the manufacture of wood for tea chests, kerosene oil cases, and soap boxes for shipment to Hongkong, Ceylon, and other places. Mining has so far made no progress in this province. The French syndicate, which, acting in conjunction with a Chinese company, obtained a concession in 1902 for exclusive mining rights in the west of the province, has not yet commenced active operations, and no mining is as yet being carried out under foreign auspices. Reports of the mineral riches of the country are most favorable, and, if the Chinese authorities could be persuaded to support this form of enterprise, the stimulus given to the general commercial welfare of the province might make up for the loss of the almost moribund tea trade and raise Foochow to some measure of its former prosperity.

JAPANESE RAILWAYS IN KOREA

The Japanese are now running trains from Fusan to Seoul. The military line to Wiju has been completed as far as Ping-yang, and in Manchuria the Imperial Engineers have opened railroad communication between Liao-yang and Antung. In March ground will be broken for the Seoul-Gensan line; surveyors have already started work, and it is hoped that the road will be finished by the end of 1905. The trunk line from Fusan to the Yalu and from Antung to Liao-yang will bring Japan into direct touch with the Chinese Eastern Railway, the Siberian route, and Europe. The Seoul-Wiju road is really a part of the Fusan–Seoul line, a continuation thereof. For the present the construction is in the hands of the army, while the Seoul-Fusan line has been built by civilians. The gauge is the same, the work, if not as thorough at present, destined to be quite as permanent. In building this line the Japanese have been fortunate in being able to use in many cases the road-bed built by the French-engineered Korean company. All along the line the railway troops are at work. The results attained thus far have been most satisfactory. In eight months they have pushed forward their line at a rapid pace. The grades are much too steep, the bridges are all of wood, the German 60–lb. rails are too light. But these are necessary evils, and will be easily remedied. Haste is all important. Proper grading and the construction of stone and steel bridges may be postponed. Work has been carried on simultaneously all along the line. The 300 miles of track to the Yalu will probably be laid by the end of this year, certainly early in 1905; but it will be some years before the line can be put into final shape. It is possible that there may be in the future some question raised concerning the right of the Japanese to retain control of the road, for which a French syndicate originally obtained the concession. This company surrendered its rights to the Korean Government on condition that all materials should be bought in France and only French engineers employed. If Japan is successful in the present war, however, her position in Korea will be such that while she may, to avoid all unpleasantness, pay a considerable indemnity to the Frenchmen interested, there will be no disputing her claim to the control of the road. Steps are being taken to fortify the island of Kojedo, which guards the harbor of Masampo. A branch line connects Fusan with this neighboring town, and the fortress will be for the express purpose of safeguarding the southern end of the railway. Commercially, the railroad will do much for Korea. The line is the steel-tipped wedge driven far into the very heart of the "Hermit Kingdom." It will be a potent factor in the future development of the peninsula, an effective means to Japan's desired end—the absolute domination of Korea.

SHANGHAI'S NEW HOTEL

The corner-stone of the magnificent New Palace Hotel of Shanghai was laid at noon on Saturday, January 21st, by Mr. F. Anderson, Chairman of the Municipal Council, in the presence of a large concourse of people. When finished this new house will compare favorably with the modern hotels in both Europe and America. It will be supplied with every device for the comfort and convenience of travelers who visit the Paris of the Orient. The site of the New Palace is at the corner of Nanking Road and The Bund and covers an area of 3¼ *mow* with a frontage to the main street of about 250 feet. The building will be the highest in Shanghai, ninety feet from pavement to eaves. It will consist of six stories, with cellars under and a winter garden over the southeast portion. On the ground floor will be a commodious and well-lighted entrance hall, says the Shanghai *Times*—entrance from the Nanking Road—staircase with two passenger lifts, billiard room, buffet, etc. This floor will also include six stores separate from the hotel proper. On the upper floors there will be 110 bedrooms with baths attached, all being provided with every modern convenience and on the top floor, in addition to a spacious and well-lighted dining room, 63x48 feet, provision will be made for private dining rooms, buffet, ladies' parlor, and a well-balanced scheme of kitchen and service arrangements. The hotel is to be built in the Victorian Renaissance style of architecture, freely treated on account of local conditions and materials, and by a judicious choice of the latter, with a strong note of color through the whole scheme. On account of the needs and requirements of the present hotel, the new structure is being built in two parts. The first portion was begun about four months ago, and it is expected that it will be nearly four years before the whole scheme is finally completed. Mr. Wong Fah Ki is the general contractor and the buildings are being constructed from designs and under the supervision of Messrs. Scott & Carter, prominent Shanghai architects.

FIRE APPARATUS, SINGAPORE.—The Tanjong Pagar Dock Company has for some years past provided fire apparatus for the protection of its property, and Messrs. Merryweather and Sons, of London, have now shipped further apparatus to Singapore. The new appliances include two double cylinder "Gem" steam fire engines, each capable of delivering 450 gallons of water per minute, similar to the latest machine of the London Fire Brigade, and a powerful fixed steam fire pump of the same pattern as used to supply fire-mains at the Midland Railway Company's works, Derby, England.

MANILA'S FIRE DEPARTMENT

AN EFFICIENT AND MODERN ORGANIZATION WHICH IS THE CITY'S PRIDE.

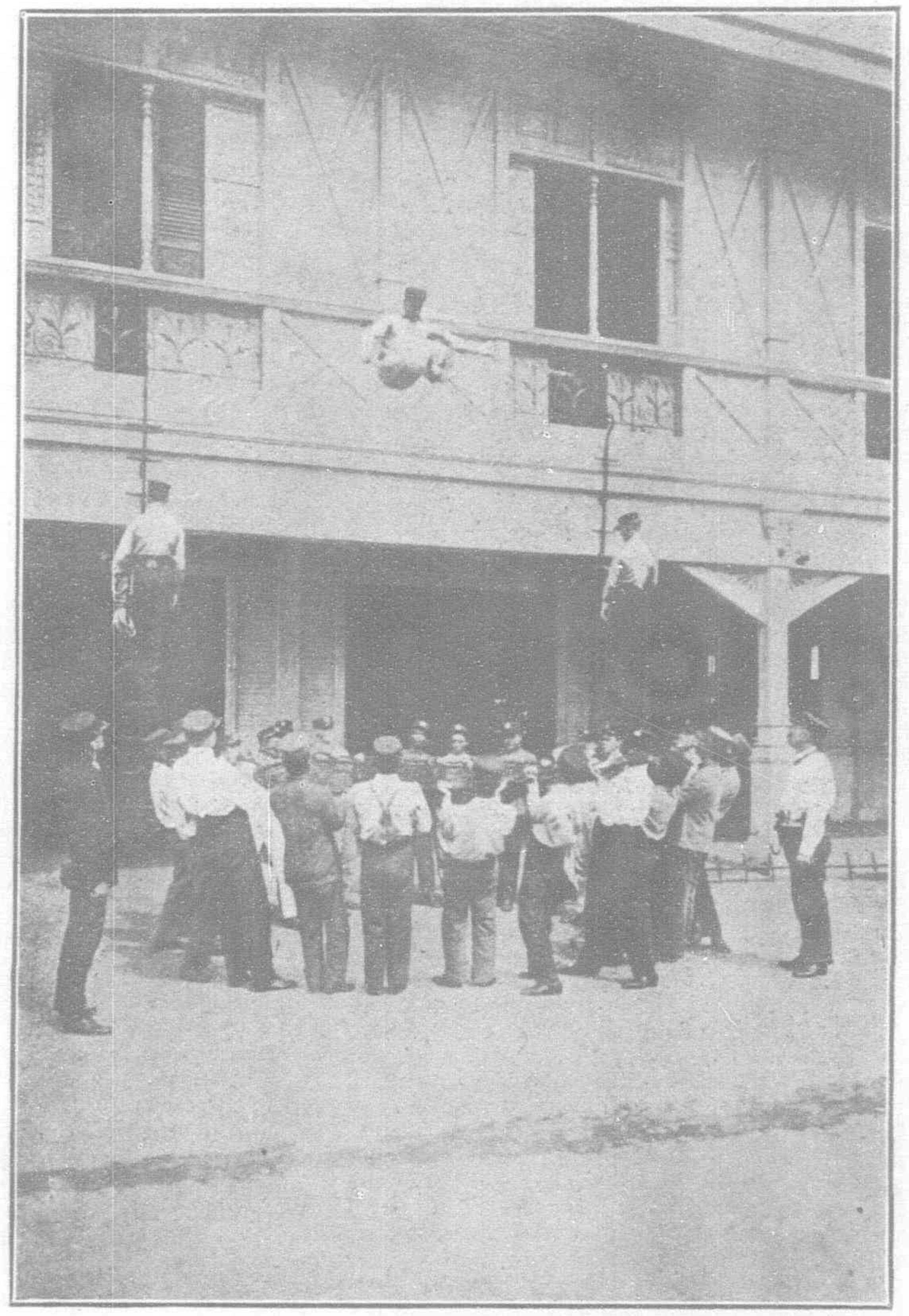
Manila's fire department is today the pride of the capital city of the Philippine Islands. Besides being the most modern and complete organization of its kind in the Far East it is equal to that of any city of Manila's population in America, and better than many of them. To Mr. Hugh Bonner, of New York City, who is regarded as the best fire chief the United States has ever produced, is due all the credit for the present high standard of the Manila department. It was this gentleman who organized the entire fire-fighting force of the city as it stands today, and supplied it with the best apparatus that the world produces. To him is due the new and satisfactory fire and police alarm system, the excellent and well-equipped stations, and the training and efficiency of men and horses. When Mr. Bonner completed his mission to Manila and returned home something like eight months ago, he carried with him the gratitude of the entire community for the splendid work he did. He left the department to his successor in such good order that it has been easy sailing for Chief Dingman in his administration of its affairs.

As compared with other fire protection throughout the Orient, Manila's department seems costly and extravagant, yet now that the people have been educated up to its value it is safe to say they would not sanction for one instant its abolition for the antiquated brigade of Spanish times and the earlier days of the American occupation. The annual report of the fire chief for the fiscal year of 1904 shows that the total expenses of the department were -P-300,562.11. Of this amount -P-181,354.95 were paid in salaries, and the balance went for new apparatus, its equipment and repair, the equipment for fire stations, etc. Including officers the personnel of the department was 93, thirty-seven of whom were Filipinos. One hundred and one alarms were responded to, resulting in a great saving of property.

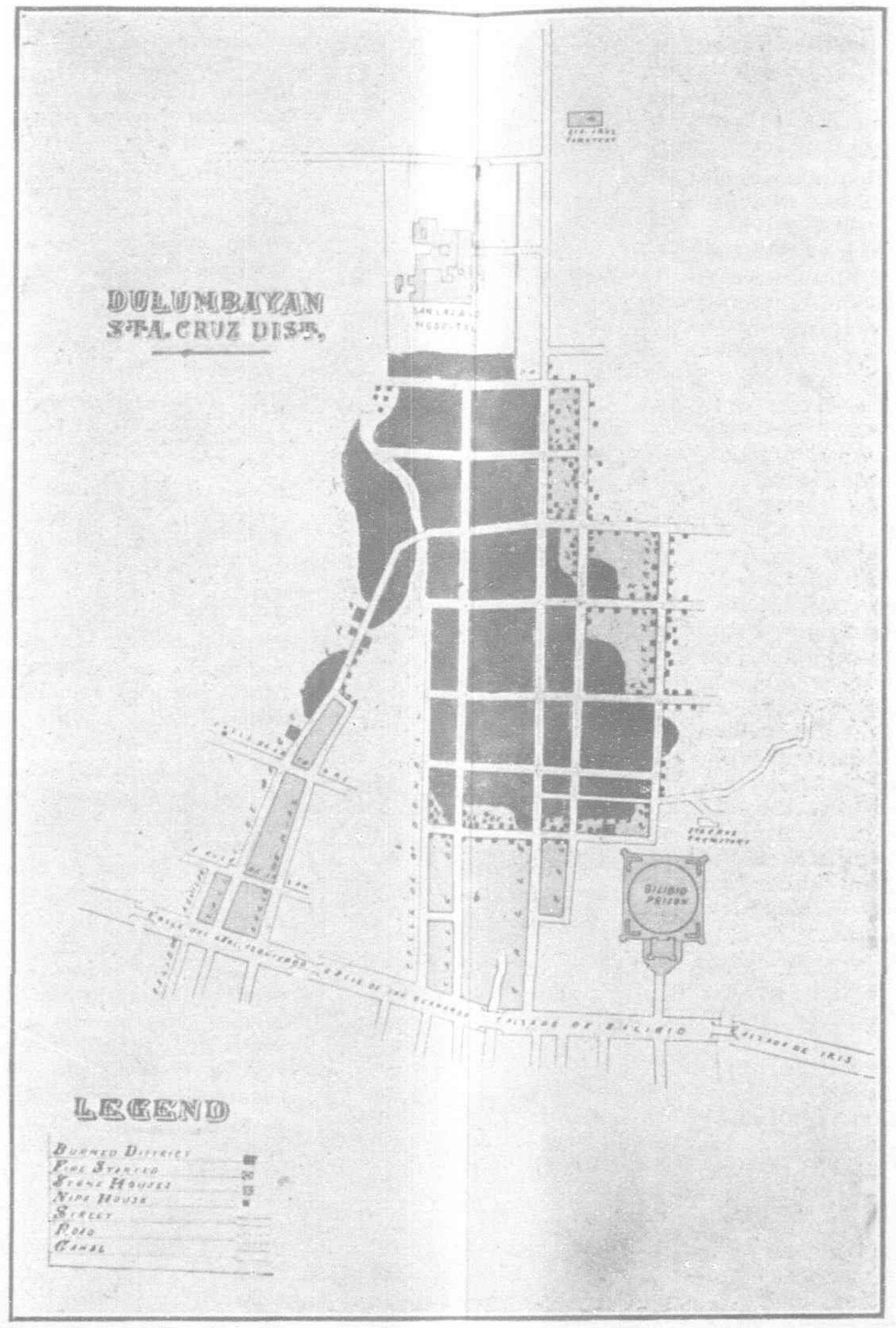
Without doubt, however, the district stations and their apparatus and equipment are the most interesting features of the Manila organization. Old stations have been entirely remodeled and improved and magnificent new ones erected in carrying out the general plan for the up-to-date and safe fire department. Most of this work has been accomplished during the last two years, with the result that today Manila can boast of homes for its firemen that can not be surpassed anywhere. They house five first-class engine companies, four chemical engine and two hook-and-ladder companies, to say nothing of supply wagons and other necessary equipment. All of this has cost the city an immense sum of money, but as the department stands today it is considered big enough for all needs of the city for several years to come with the addition of a good fire boat for river and harbor work, which is likely to be supplied in the near future.

During the fiscal year of 1903 the fire station in the San Nicolas District was received from the hands of the contractors and placed in use. Since then the interior has been considerably altered for the comfort and convenience of the firemen, and as it stands today it is a most satisfactory station. The quarters in the station of the Santa Cruz District have been altered and repaired and those in the station of the Paco District have been entirely overhauled, repaired, and painted. The Intramuros station has also been brought up to requirements, and during the last year the new Tanduay station was completed and occupied by a chemical and a hook-and-ladder company, also Engine Company No. 5, equipped with a full complement of officers and men, a second-size metropolitan steam fire engine, a second-size hose wagon, etc. Other stations are to be supplied or rebuilt as necessity demands.

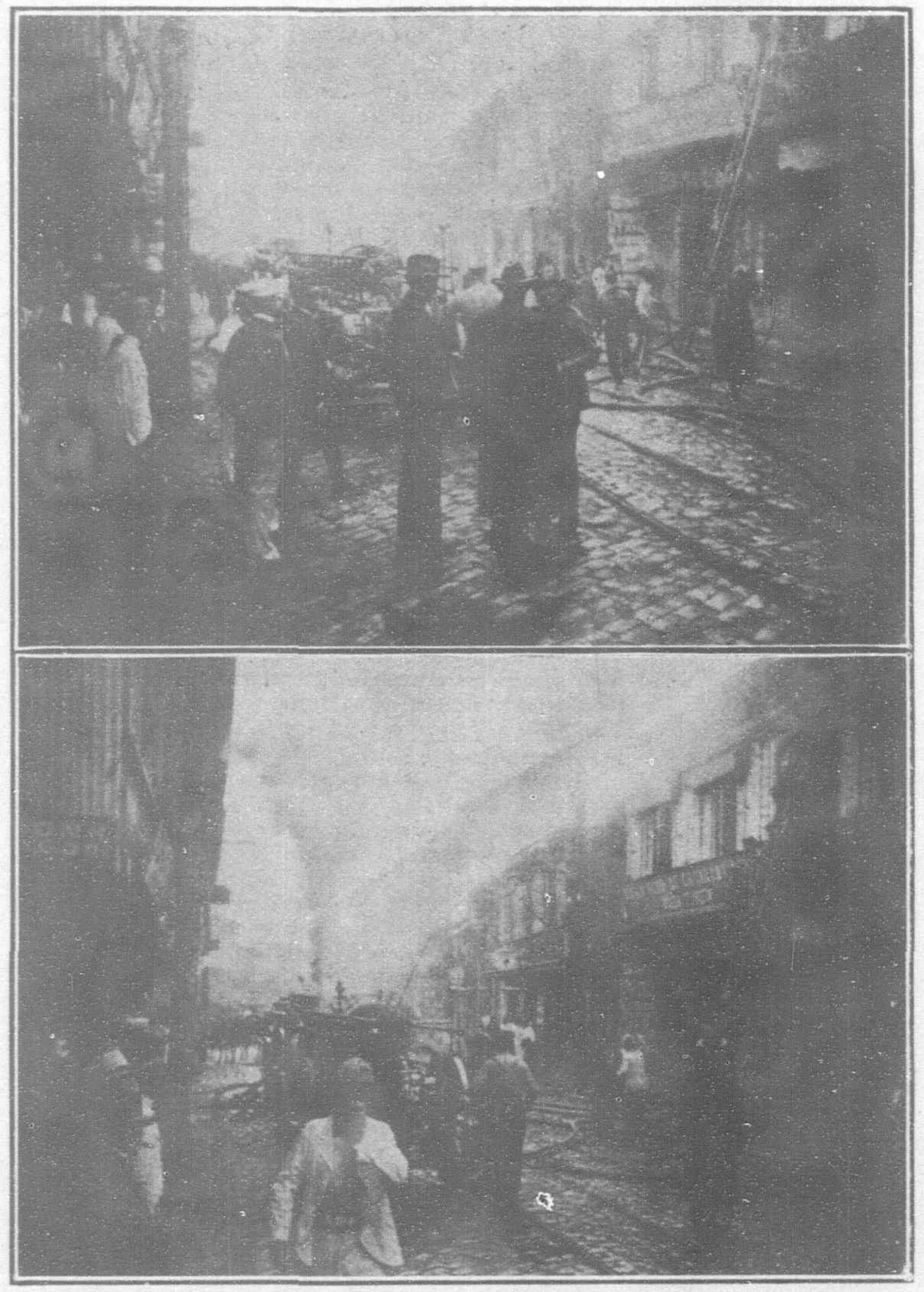
MANILA'S FIRE DEPARTMENT



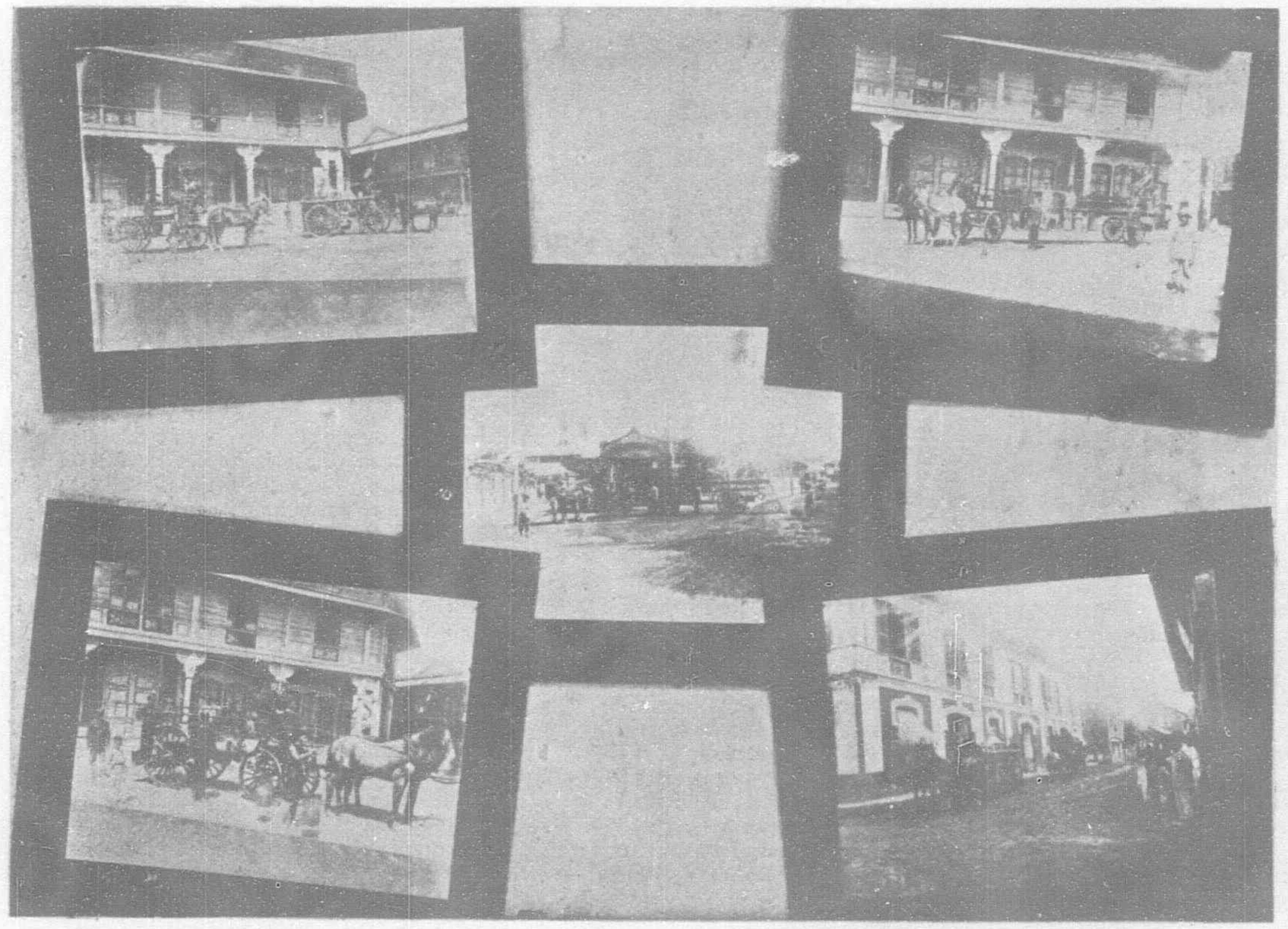
FIRE DEPARTMENT DRILLING WITH LIFE NET.



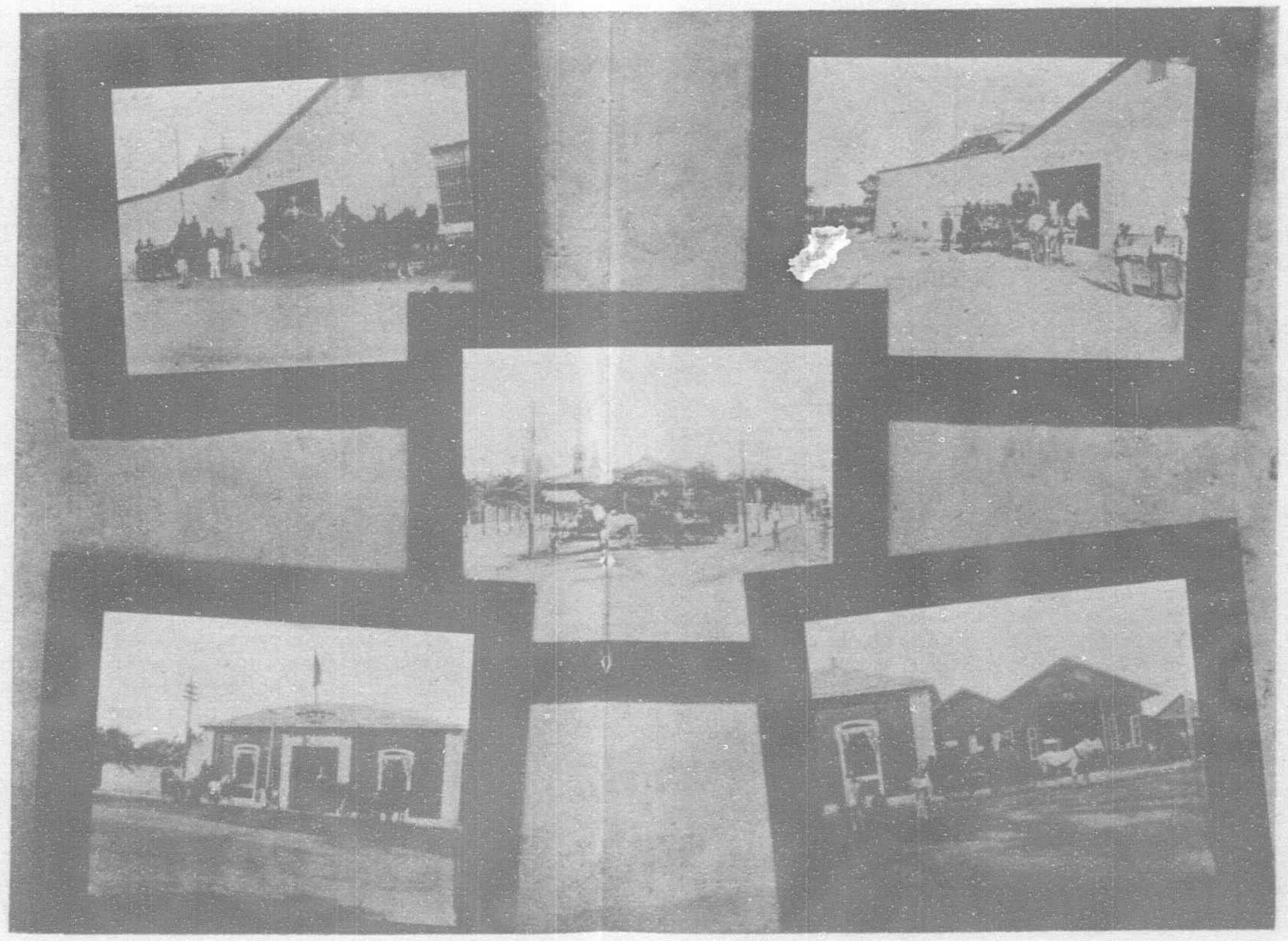
AREA OF NIPA FIRE IN TROZO, MANILA, MAY 19, 1903.



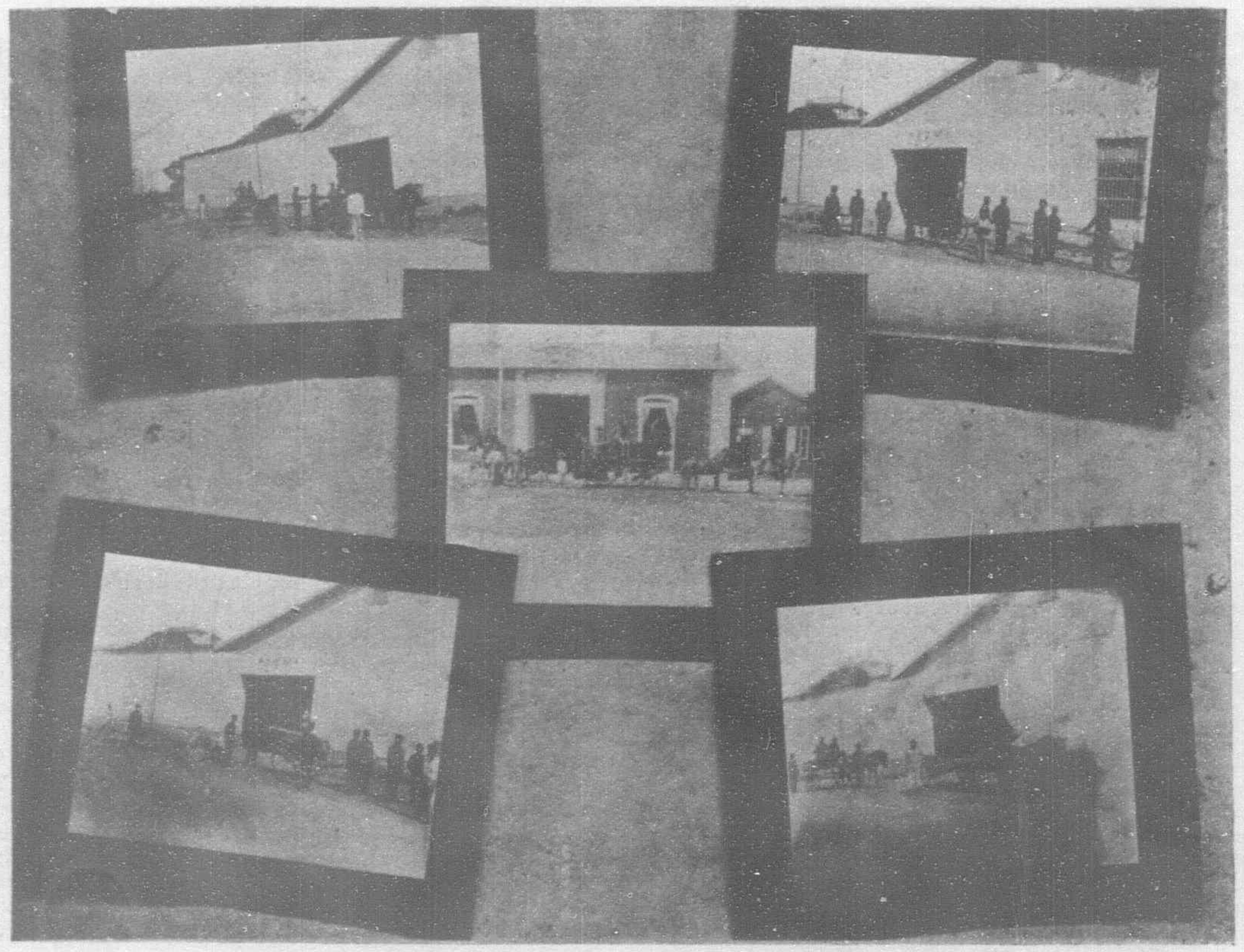
FIRE DEPARTMENT AT WORK, 1903.



FOUR STEAM FIRE-ENGINE COMPANIE, SWITH HOSE WAGONS.



CHEMICAL ENGINE AND HOOK-AND-LADDER COMPANIES.



MANILA FIRE DEPARTMENT, 1900, SHOWING OLD-STYLE APPARATUS.

STEEL SHIPBUILDING IN HONGKONG

By J. W. Graham.

GENTLEMEN— It is with diffidence that I undertake to read this paper on *Practical Steel Shipbuilding in Hongkong* as so many excellent papers have already been read in this Institute on "shipbuilding," and many of the authors are amongst us to-day, and I may say some of them present this evening. It is, therefore, with diffidence that I do so; but it is also with the intention of inducing other qualified members to take up this "important subject" as it ought to be taken up in a Colony like Hongkong, which is one of the largest shipping ports in the world.

Shipbuilding being a subject upon which dozens of papers might be read, without touching on the whole of the points to be taken into account by the Naval Architect in arranging and connecting the different pieces together which go to form a modern floating godown, I therefore purpose confining my remarks this evening to the actual steel portions of a vessel, without touching upon the "wood work" or the "engines or boilers," "launching," "outfit," etc.

Considerations to be taken into account are:—

1st—The demand for ships.

2nd—The cost to purchasers, and the time of delivery.

3rd—The cost of production, consistent with reasonable profits to the builders.

(1) The demand for ships in this Colony is, at present, chiefly confined to light draft river steamers; but I see no reason why we should not also include vessels up to say 300 ft. for coasting purposes, also the smaller gun boats, and torpedo destroyers for the different governments; which are at present in use in these waters.

(2) The cost to purchasers I do not intend to deal with to-night, but the time of delivery will be naturally embraced in the third item.

(3) The cost of production, with reasonable profits to the builders, is the subject which I intend to take up to-night, and will try to point out the best methods to adopt with Chinese labor, to get the desired results.

The cost of material specially ordered for a steamer may be, at home, anything between $50 and $70 per ton, to which must be added the freight to Hongkong plus the delivery in the works where the vessel is to be built, but the cost of bringing out the material is somewhat balanced by the Canal dues, crews' wages, coals, stores, etc., required to be paid by the owners who have their ships built at home.

With your permission, I will first briefly mention the names of the different parts of a vessel, and the general uses of those parts, which may better enable some, who may not be acquainted with the different technical names, to follow me in my remarks.

FRAMES—The frame of a ship really embraces the two angles, also the floor plate and beam complete. But in ordinary shipyard phraseology, when we allude to the frame, we mean only the angle which is curved to shape of the outer shell, and connected thereto in a transverse manner. The uses of the frames are to maintain the correct shape of the shell; by giving transverse strength to resist the tendency of the ship to alter her shape when rolling in a seaway, and to unite the different strakes of shell plating, so as to form one body of uniform strength. The frames are generally made of angle bars, but there are many other forms in use, as zed bars, bulb angle, channel bars, etc., also Web frames, which are fitted when hold beams are undesirable.

REVERSE FRAMES are angles which are placed in a reversed manner to the frames, and are also set to the curvature of the shell, and riveted to the inner flange of the frame. Their uses are to assist the frame in its work of resistance against transverse stresses, by stopping the inner flange of the frame from buckling; and also to connect the frame firmly to the inner supports, as keelsons, stringers, deck back bars, etc., also to take the wood lining, or sparring, which is usually fitted in merchant ships.

FLOORS, are plates placed in the lower portion of a ship, in a transverse, vertical position, to give strength and rigidity to the vessel, and in the case of cellular bottom vessels, when they are united to the fore and aft girder plates, form a most compact body. They also resist the upward pressure of the water, which tends to force upwards the bottom plating, and also maintain the correct shape of the vessel, when in dock or out of the water.

BULKHEADS are transverse frames, completely filled in with plating, thus forming a W. T. barrier, right across the ship. And they give great transverse strength to resist the racking stresses when the ship is rolling in a seaway.

CENTRE KEELSON is a continuous girder, placed on the middle line of the ship in a vertical position. It gives sound foundation and rigidity, also great resistance against longitudinal stresses, and also gives good fastenings to the frames and floors in cellular bottom ships. In ordinary floor vessels, they are usually fitted continuous, on the top of the floor plates, with a plate intercostal, run down between the floors.

SIDE KEELSONS are adopted in vessels not fitted with double bottoms, they usually consist of double longitudinal angles on the floor tops, with intercostal plates connected to them, and carried down between the floors and connected to the shell plates with single angles, their uses are to stop the floors tripping, also to assist in giving longitudinal strength and resistance to the upward pressure of the water. In boats fitted with double bottoms, either continuous girder plates or intercostal girder plates are fitted in a fore and aft direction to answer the same purpose.

SIDE STRINGERS AND BILGE STRINGERS are fitted with the intention of giving longitudinal strength, also to stop the sides of the vessel being crushed in, and when those are thoroughly connected to the frames and bulkheads, tend to give great rigidity to the vessel. There are many forms of side stringers used in ordinary vessels, some with double angles riveted together, others with double angles and a plate riveted between them and carried to the shell and connected thereto by single angles; others again with a much wider plate fitted on brackets consisting of a horizontal plate with two face angles, and the plate connected to the reverse-frames by continuous back bar and connected to the shell by intercostal angles and all carried by the bracket plates, which are fitted on alternate frames.

SIDE INTERCOSTAL STRINGERS are formed of horizontal plate, fitted between the web frames in boats where it is necessary to dispense with the hold beams, or even the lower deck, a thing that is quite frequently done to facilitate the putting in, and stowing of the cargo when consisting of large pieces, such as is very frequent in general cargo.

BEAMS are of many forms, either angle, bulb angle, bulb plate with double angles, Tee bulb.

Channel bar, also specially built strong beams, etc., these are placed transversely, in line with the intended decks; in the upper decks they are given a "camber" or round up of ¼ inch to every foot in width of beam. They are to carry up the decks, and to tie the sides of the ship together; thus stopping any panting.

HOLD PILLARS are fitted to support the decks and to tie them in rigid position, when the vessel is working in a seaway, or under other stresses. They are often used to take the shifting boards, or temporary wooden bulkheads, which are fitted at the middle line in boats carrying cargo in bulk, as grain, etc.

DECKS we are all familiar with, they are sometimes built of wood, but when strength is an important factor they are built of steel plates, and riveted to the beams, also connected to each other and to the shell plates at the sides. They are fitted for the purpose of dividing the cargo spaces, they give great strength to a vessel, and along with the W. T. Bulkheads, divide the vessel into numerous watertight compartments, thus adding greatly to her safety, if in any manner the shell plates may get pierced, "as a well built ship will usually keep afloat, with one or even two of her compartments filled with water."

TANKS—Cellular bottom is the usual method of making ballast tanks, which form a double skin, or shell. The first method adopted was the McIntyre and other similar tanks, which were fitted by placing fore-and-aft girders on top of the ordinary floor plates; these proved to be a source of great trouble and expense, owing to the girders leaving the reverse frames, either by breaking the rivets, or enlarging the holes in the reverse frames to such an extent that the heads of the rivets were drawn through the hole. Thus we find the "Cellular system" is almost universally adopted, and although there are many forms of side tanks in use, yet it is still necessary to hold to the lower tanks as they not only give the necessary strength and safety from sinking when the outer shell is pierced at the bottom, (and I would here mention that the subdivision of these tanks is a very important thing), but they also form a splendid storage floor, on which to store the cargo. They are of great service to vessels when discharging cargo, or in a light condition; as by filling the tanks, the ship may be kept to the desired trim, without the necessity of having to take in ordinary ballast, as was customary in the old style of vessel. The fore and the after peaks also greatly assist in this, and are also useful for altering the trim of the vessel when it is necessary to be on an even keel in crossing a bar, or in any other shallow water.

TANK MARGIN is a longitudinal W. T. girder, placed in a fore and aft direction, usually at right angles to the shell plating; and it forms the boundary of the tank at the sides. It also gives a good connection for the upper portions of the frame and frame brackets, which are riveted thereto, thus continuing the transverse strength; this girder also adds to the strength of the vessel when rolling, as will be shown later on.

HATCHES are large openings through the different decks, through which the cargo is passed for stowage below. Around those openings, coaming plates are fitted, and made W. T. by securing them to the decks, and riveting them thereto, while around the top a moulding is fitted, also a rest bar fitted two inches from the top, to take the wooden hatches, over which a canvas cover is put, and secured by means of cleats, an iron batten, and wood wedges, thus securing watertightness of the vessel during rain, or when heavy seas are sending spray on board. I would also mention here that it is necessary to make special compensation for all deck openings, when they in any way affect the longitudinal strength of the vessel.

KEEL.—There are many forms of keel, but the usual style is a flat plate keel as the older style, "the bar keel," is fast dying out, except in a few special cases. The bar keel is formed by a number of slabs of iron, of oblong section, placed lengthwise in a fore and aft direction, and standing vertical and connected to each other by means of scarphs, the length of the scarph to be nine times the thickness of the keel bar, thus uniting them, without adding to their continuous thickness. Immediately above this, the centre keelson is fitted, but not connected to it. The *Side Bar Keel* is of slightly different formation, and is much stronger, as the centre keelson plate is carried down to the bottom of the keel level, and slabs fitted half the thickness of the bar keels, one on each side. These slabs are not scarphed, only butted against each other. These, when the garboard strake is flanged and fitted to it, as is also done in the first case, form a very strong keel indeed.

The keel usually adopted consists of a shell plate, placed "half on either side of the middle line." It is usually thicker than the adjoining plates. It is connected to the centre keelson by means of continuous double angles, and the lower ends of the frames are also connected to it. By adopting this style of keel, the owner thus gets from six to twelve inches greater carrying capacity, with the same draft, which is a great consideration in Chinese shallow rivers.

STERN POST is a large forging, or casting, of which there are many varieties, those in the "Holt" steamers being the latest, and a considerable departure from the customary stern post, the usual shape being, as per rough sketch. It is customary to make the stern post twice the thickness of the keel bar, and in width slightly less than the depth of the bar keel, in ships up to 350 ft., above which, although the width holds good, yet the thickness is greatly increased up to as much as three times that of the keel. At the bottom of the aperture, the post is broadened out, to give resistance against the side stress, which is caused by the rudder being put hard over, when going full speed, or when diving in a heavy sea. It is also slightly larger section at this part, and, by reducing the depth, gives more clearance for the propeller, which ought to be kept as low as possible, so as to get the best results from the propeller when in light condition. The gudgeons for carrying the rudder are forged on or cast on with the remainder of the frame; they are usually spaced from four feet to five feet six inches apart.

STEM POST, usually of forged iron, of oblong section with the fore end rounded off. This is set to the required shape, and holes drilled in it, to connect it to the stem or shell plates. If it has to be connected to a bar keel, the section at the bottom must be the same section as the keel bar, and slightly reduced at the water line, and from there, gradually reduced to ¾th the sectional area at the top. If connected to a flat plate keel at the bottom, it was customary to forge the stem to the shape called a club foot, and secured to the keel plate, which had to be set to the correct shape of the club foot, but the more up to date method is to rivet on an angle at each side of the bar keel stem, in a manner similar to that shown in the rough sketch. This is approved by Lloyds, and is a much cheaper method, and so far as my practical experience goes, is equally as efficient as the older method. By this means, the making and setting of the stem post is greatly simplified.

RUDDER, of which there are many methods of construction, some with forged or cast frames with a plate riveted on either side and filled in between with light wood, pitch, or other light substance; others with single plate, of greater thickness, fitted to a specially constructed frame. And in the case of "Holt's" steamers, plated on each side, of a specially constructed framework of steel, made thoroughly watertight, and of such size as to nearly balance itself in the water; thus greatly reducing the wear and tear of the bottom pintles, and lessening the dead weight at the after end, and giving a clear run for the water, thus doing away with part of the heavy drag at the stern post. The use of the rudder is to steer, "or alter" the direction of the vessel when under way, and it is controlled by a hand wheel, also by steam steering gear, of which there are many varieties.

SHELL, which is of course the principal part of the construction, as without it the other portions could not possibly float. In some of the smaller steel framed vessels, the shell is made of wood planking, but those are called "*Composite*" vessels, and it is not my intention to deal with them to-night. Therefore, we will take the usual shell, which is made by fitting a great number of steel plates to the correct curvature of the frames, and connecting those to the frames and to each other, by means of rivets; they are then caulked, by means of a special tool, to make the whole watertight, and thus complete the structural part of the modern floating godown. Great care must be taken to arrange the proper shift of butts, so as to make sure that no two butts come in the same space, without two strakes of plates between them. And that no two butts come in adjoining spaces, without there is one strake of plating between them.

Having briefly described the names of the different parts of a modern steamer, I will touch lightly upon a few of the reasons for the extra strength required at the different parts of a deep sea vessel, which the naval architect must take into account when designing a steamer. I have already alluded to "stresses" which are put upon some of the parts; they consist of longitudinal stresses, transverse stresses, stresses due to propulsion, local stresses, etc.

LONGITUDINAL STRESSES are due to hogging and sagging, thus:—In hogging the sheer strake and upper shell plates, the deck plates, etc., have a *tensile* stress applied to them, at or about the midship part of the vessel, while the lower portion of the shell plating, the keel, keelsons, tank girders, etc., have a compressing stress; these are due to excess of buoyancy at the midship part, as indicated by the arrow marks, and to excess of weight at the ends, which take place when a vessel is at rest, also when she is supported on a wave midships. In the *sagging* position these stresses are reversed, thus being applied in the opposite direction (as indicated by the arrow marks); this takes place when the vessel is supported at the two ends by waves, while the midship part is in the hollow of the wave and unsupported.

TRANSVERSE STRESSES are due to the tendency of a ship to alter her form, when heeled over to either side, as the centre of gravity of the mass and the centre of buoyancy are acting in a different manner to that when she was in an upright position, and in perfect equilibrium.

STRESSES DUE TO PROPULSION are, in a single screw vessel, vibration due to the working of the engine pistons and cranks, also to the propeller racing when out of water, while pitching in a heavy seaway; and in a ship with double engines, an extra heavy twisting stress is also put on when one engine is going ahead, and the other full speed astern, tending to force one side of the ship forward, and to drag the other side aft, and in sailing vessels, stresses due to the twisting motion exerted by the sails when tacking, etc.

LOCAL STRESSES are caused by placing heavy weights in any particular position, as engines and boilers, heavy cargo in one hold, and light cargo in others, as cargo of iron, etc., in merchant vessels, and heavy guns, armor plates, and barbettes, also by the engines, propellers, rudder, etc., in men-o'war vessels; also when the vessels are docked and resting on blocks insufficiently distributed.

Now if you will just look at the sketch, showing the hogging and sagging positions, you will be better able to realize that somewhere between the tensile stress at the top and the compressing stress at the bottom, there must be a part at which there must necessarily be no stress whatever. This is called *The Neutral Axis.*

NEUTRAL AXIS.—Therefore, as this part has not any stress applied, it follows that the part furthest from this point has the greatest stresses to resist. To try and make this point a little more clear, I must tell you that in designing a ship, the naval architect, from his plans constructs what is called an *Equivalent Girder*. This is done by concentrating all the continuous plating, and angles, on to the middle line, in the form of a girder. This may be made to any convenient scale, and from this equivalent girder he calculates the position of the neutral axis, which having obtained he can then calculate, according to one of the methods in use in the classing societies, as Lloyds, etc., whether or not this girder is of sufficient strength to resist the stresses to which it may be subjected, and that, without straining. This imaginary line, or neutral axis, is always parallel to the water line, no matter to what angle the vessel may be heeled over by the sea.

Now you will be the better able to follow me, when explaining the reasons why some of the parts of the shell plating, etc., are made thicker than others. Take, for instance, a vessel lying at rest, and in perfect equilibrium, in still water. She is subjected to a hogging stress as I have already stated, owing to excess of buoyancy amidships, and to excess of weight at the ends. If you look at the midship section, you will see that the parts furthest from the neutral axis are the keel below, and the sheer strake and stringers or deck above, hence they require to be made stronger to resist those stresses. The shell plating near the neutral axis, you will see, having no stress applied, would answer the purpose almost as well if it were only thin plating, providing the vessel was always at rest in still water, and that no corrosion took place. But as the vessel is not always at rest, and as the neutral axis remains parallel to the water plane, it follows that, when she is heeled over, the part that was in line, with the neutral axis at rest, is a considerable distance from it, first above and then below it when the vessel is rolling. And as corrosion is usually greatest between wind and water, it is therefore necessary to make the plates of sufficient thickness to counteract this. Now if you will look at the sketch, showing a vessel heeled over, you will see at a glance the necessity for making the sheer strake and stringer plates, also the bilge plating, much stronger to resist the heavy tensile and compressing stresses to which they are subjected, and of course when heeled in the opposite direction, the opposite sides of the vessel are equally affected.

Bilge keels or rolling chocks are fore and aft girders, fitted on the outside of a vessel, with a view to stop excessive rolling, which they do with good results; they also add considerably to the strength of a vessel when efficiently built and firmly connected to the shell plating.

Engine and boiler seats and shaft stools, also the necessary bunkers, are fitted in steam vessels. The bunkers are for storing the necessary coals for steaming purposes. The engines are for the propulsion of the vessel; the boilers for supplying the necessary concentrated force to the engines; and the shaft and shaft stools to efficiently transmit the power to the propeller, which by revolving in the water forces the steamer through the water to her destination. But as most of our members are engineers, it would be superfluous for me to dwell on these subjects any further than to say that the engine seats, thrust seats, and shaft stools should be made strong and securely united to the main structure of the vessel, with a view to do away with vibration as much as possible.

THE BEST METHODS TO ADOPT WITH CHINESE LABOR TO GET THE DESIRED RESULTS.

For ages the Chinese have been expert navigators and builders of wood vessels, and we are told that they have the credit of being the first to find out the magnetic North, and that they invented a crude form of compass, for the purpose of navigating their ships. But perhaps it is news to many to learn that the Chinese were the first in the world to build their boats with watertight divisions and bulkheads, to better enable them to withstand the elements. However, that being wood shipbuilding, does not come within the sphere of my paper to-night.

The usual method adopted by Chinese in steel shipbuilding, if left to themselves, would be similar to those adopted at home in the early stages of steel shipbuilding, *viz:* to first set the plates to the required shape, and then put them in their position on the ship, mark the holes, and take the plates down again, punch and countersink them, shear the plates to the correct size, then refit and rivet them.

Now the best methods to adopt, in the opinion of the writer, is first to handle the material, as plates and angles, as little as possible.

Secondly, not to handle it twice if the same object can be attained by handling it once.

Third—As Chinese are exceedingly slow at punching plates and angles, it is necessary, for quick despatch, not to have to wait till one plate is punched and in position before marking an adjoining one.

Fourth—Employ labor-saving machinery as much as possible, providing there is sufficient work in hand to compensate for the cost of the said machinery without making an undue outlay against one vessel.

Fifth—The plates ordered for the required ship should be as near uniform in size as is consistent with the form of the vessel.

(*a*) Handling of material as little as possible:—To accomplish this, it is necessary on taking delivery of the material to place the same in a pre-arranged position, each class of plates or angles being separated and classified while taking them from the bogie. By this method, if the plater requires frame angles, it is not necessary for him to turn over hundreds of other angles, as keelson angles, etc., to get at the required frame. The same applies to plates, the different strakes of shell plates, decks, tanktop, stringers, or casing plates, etc., should each be placed in a pile by themselves to facilitate the finding of the required plate, as the workman will then be able to tell which pile it is in. The usual Chinese method is to dump them down, all in one or two piles, which necessitates a particular plate being turned over a great number of times before it is finally punched and in position, all of which must of necessity add to the ultimate cost of the vessel.

(*b*) Not to handle twice if the same object can be obtained otherwise:—The workman, thus being able to readily find the required plate, it should be marked according to one of the methods I suggest, then taken and all the holes punched by the same gang of men, and also sheared by them to the required size, and placed on the countersinking machine. Those men should then proceed with the next plate. This plate should be run from the countersinking machine to the planing machine, by means of an overhead crane. After it is planed, it should be taken in hand by another plater, with the necessary gang of coolies, who should set it to the required curvature and place it in the correct position on the ship.

Almost the same arrangements will apply to the working of angle bars, as by this method you not only specialize the jobs—which is a necessity with Chinese labor—but the foreman in charge is thus able to see where the stoppage (if any) takes place, and by concentrating his attention to that particular part, is enabled to balance matters, thus getting the best results from the labor he has to employ.

(*c*) To overcome the necessity for waiting till one plate is in position before marking the adjoining plate, as is customary in most shipyards even at home. There are many cases where it is an absolute necessity to do it; but there are many cases where it can be got over with great benefit to the workman and consequently to the employers, as in the marking of all straight work, such as keelsons, flat keel plates, intercostal plates, and angles, tanktop plating, all of which with a little care, can be done by the present workmen. But when it comes to the more intricate work, as shell plating, tank margin plates, floor plates and frames, stern counter plates, decks, deck stringer plates, hatches, etc., then it is a little more difficult. In the opinion of the writer, although we have an odd number one Chinaman who could grasp the idea, when explained to him, and carry out the same, yet there are few of the native workmen capable of doing this and the No. 1 man, instead of generally supervising the work, has, with the present state of affairs, to devote his time to one or two jobs, to the detriment of the others. Therefore, I think it is essential to the cheapening of labor to have a European who will devote the whole of his time to the loft, and who is capable of supplying molds, with the necessary holes either marked or bored, which should be given to the Chinese No. 1 with the necessary instructions to make a certain quantity of plates or angles from the molds supplied. By this method, a great saving in labor and also in the price of wood, etc., would be the result. Take for example, in straight work, as keel plates, or a centre keelson, with the plates and angles complete, all that is necessary is one plate mold, and two short pieces of lath with the holes bored in them, and a half butt lath to mark the butt holes for the plates, also one straight lath with the landing holes bored in equi-distant; this long batten will also do to mark the angle bars. This large mold gives the correct angle in that the frame holes are to be punched in relation to the middle line, which, in most cases of straight work, is at right angles. In the building of cargo boats this mold may serve for several ships, as a little difference in width can easily be allowed for; the shorter battens have the holes marked in the correct position, and if correctly done they can be applied from either end, without altering the position of the holes, which is a very essential thing when dealing with native or even European labor. When working with single molds in this manner, if a mistake is made in the first instance, then dozens of plates may be spoiled before the mistake is discovered, but with a man who thoroughly understands his business, it is almost an impossibility to spoil any of the work. In the case of decks and deck stringers, the plates must be marked to the expanded sizes by taking the "sheer" batten with the position of the beams marked on, and letting it spring back to a straight line; this will give the exact length of plate required to reach from one end of the deck to the other, following the "curved line" or "sheer" which is very great in some ocean-going vessels; then by bending a batten to the curve of the beam mold and marking the frame widths on it, and letting it spring back to the straight, this gives the expanded widths of the deck. From those, all sizes for the new deck can be taken. Also all stringer plates marked and punched. This method has the advantage of bringing the frame heads and beams into their correct positions, without the aid of ribands, and they are fixed in their positions by at once riveting the stringer plates as soon as the beams are erected in position. Hatches, either round or square corners, can also be marked and punched on the straight, and set afterwards, and all can be prepared while the frames are being set and riveted, and I might go on enumerating other work which might be done from the loft floor, as side keelsons, deck tie bars, stern counter plates, etc.

But my whole object is to make clear the essential point which is to be borne in mind when dealing with native labor, *viz:* to keep as many men as possible working every day from the time of starting the vessel till she is completed, without having one set stopping or hindering the others; and to be able to locate the parts or portion of the work which is dragging, so that the foreman in charge can devote more of his time to that particular part, and by advising or instructing the No. 1 man in the carrying out of the particular job with despatch, thus getting the greatest amount of work turned out in the shortest possible time with the material we have to deal with.

(*d*) Employ labor-saving machines as much as possible, where it can be done, without adding to the ultimate cost of the vessel. Thus punching and shearing machines, planing and counter-sinking machines, angle-setting and shearing machines, and flanging machines, are an absolute necessity in a modern shipyard. And the other machines, as hydraulic riveters, pneumatic riveters, caulkers and drilling machines, when efficiently laid for the special purpose they are intended, are very useful, providing there is sufficient work in hand to cover the cost of running the same without adding to the cost of production. But in my opinion, the most useful conductor of power in a modern shipyard is electricity, as it can be connected and applied almost at once without the necessity of having special men to lay them, as is the case with pneumatic tools if required when the vessel is afloat, and as time is an important factor in these days the power that can be most easily applied will undoubtedly prove the most satisfactory. By electricity we can also have the use of good lights without having to run a second power.

(*e*) The ordering of plates of uniform size greatly facilitates the marking by molds, from the loft floor. In cargo vessels a useful size is from 14 feet to 18 feet long and from 48 inches to 60 inches wide; those sizes can be used for most decks, tank tops, bulkheads, shell bottom plates at the straight parts, with the necessary tapered plates at the ends. This especially applies to flat-bottomed river boats.

Cost of labor in shipbuilding is the point upon which the whole question hinges, whether or not Hongkong will ever be a shipbuilding centre, for if we cannot build a vessel here as cheaply as it can be built at home and sent out here, then we can never expect to receive many orders. Therefore, it is to the interests of all colonists to do their best to encourage shipbuilding, also all other industries. Even in the eight years since I came to this colony, the cost of living to the Chinese workman has practically doubled, and quite recently a new ordinance was passed which doubles the rents of the native contractors, and those things all tend to handicap shipbuilding in Hongkong, which is already heavily handicapped by not having the iron and coals on the spot, all of which have to be imported at great cost. Therefore, to be successful competitors in shipbuilding, we must use our best endeavors to keep down the cost of labor, which is our only present hope of making Hongkong a payable shipbuilding centre.

To conclude I will now give you the net cost of labor for the steel construction of a few vessels in detail built at home in up-to-date yards, the whole of which, being under my supervision, I can with confidence say that they are a fair average price for the actual labor and a fair average of home prices for vessels of their particular class.

LABOR COSTS.

	Merchant Vessel.	Torpedo Destroyer.	Cruiser.
Length B.	288' 6''	200' 0''	300' 0''
Breadth	38' 0''	19' 7''	43' 8''
Depth	25' 6''	8' 3''	17' 6''
Cost of	£ s d	£ s d	£ s d
Plating	1,433 4 6	836 11 6	5,657 5 0
Riveting	1,743 2 5	1,056 8 9	4,438 1 9
Caulking	279 8 7	122 15 6	2,630 19 1
Drilling	357 5 1	341 11 9	2,943 19 4
Ang.smiths	152 15 4	94 14 6	1,220 2 7
Total			
At Home	£3,965 15 11	£2,452 2 0	£16,892 7 9
" " or	$42,681.75	or $26,3[illegible]9.00	or $181,592.25
In Hongkong	£3,083 12 0	£1,888 4 0	£11,804 0 5
" " or	$32,826.00	or $20,298.00	or $126,497.40

Closing Remark.—When asked to assist at this Institute by reading a paper I promised to do so, thinking that I would have the time to devote to it, which is essential to the writing of a good paper, but unfortunately I have not been able to give this paper the thought and care that should be bestowed on a subject such as this. I had intended dealing with the scrieve board and its uses, as a means of reducing the cost of labor, but owing to the length of my paper and the limited time, I had to omit it.

But if you will take it in the spirit it is given, *viz:* with the best intentions, and to set others thinking and writing upon the subject, then I will take it as a compliment, and will do my best to make clear any points in my paper where anyone has not quite caught my meaning.

I thank you all for the generous and courteous attention you have given me this evening.

HONGKONG SHIPBUILDING

Messrs. George Fenwick & Co.'s New Plant at North Point

As one of the greatest shipping ports of the world, Hongkong has given rise to many various projects which are concerned with the shipping industry, says the Hongkong *Telegraph*. One of the principal of these was the opening up of engineering and shipbuilding works, and a walk along Praya East to day is sufficient evidence of how this industry has prospered and expanded. Even in the early days of the colony's existence as one of Great Britain's Eastern possessions, when the great bulk of the shipping passing through the port consisted of sailing vessels, the shipbuilding industry began to assume large proportions, and when steam to a great extent ousted the old type of vessels, the engineering works sprang into existence and yearly grew of greater importance. One of the earliest firms to be established in Hongkong was the Victoria Foundry, which began operations in the Wanchai District and has now invaded North Point, where workshops covering five acres of land are in course of construction. The old works at Wanchai are still in operation, but in a year or two the main portion of the business done by the Victoria Foundry, as it was once called, or Messrs. George Fenwick & Co., Limited, the name by which it is now known, will be transferred to North Point, and the Wanchai District will see the greater part of its glories as an engineering and shipbuilding centre depart to pastures new.

IN THE OLDEN DAYS.

The reason for these changes is, of course, to be found in the rapid development of the district and the extension of the company's business. At one time vessels were built, and launched at Wanchai. There was a creek running through the premises of George Fenwick & Co. from which the vessels were launched. But the Government stepped in and closed the creek, closed a drawbridge which then existed, and the construction of certain classes of vessels at that point was effectually stopped. The Wanchai works then became an engineering yard solely, although small launches were frequently built there and carted across the street to the sea. Another check came when the tramways started running. It was impossible to stop the cars for an indefinite time, in order that boats, even as small as launches, should be dragged across the thoroughfare. It therefore became imperative that new works should be erected, and these are now in progress at North Point, where it is believed that a new era of prosperity will be inaugurated.

But a word in the first place regarding the origin of the company. As already stated the works at Wanchai were known for a long period as the Victoria Foundry. For nearly twenty years the foundry was in private hands, proving a very successful venture, and turning out vessels not only for local owners but also for customers in other countries, from Vladivostok to Port Darwin. In 1889, however, the firm became a limited liability company under the style and title of George Fenwick & Co. Success has continued to follow the rejuvenated concern until now, through one circumstance or another, it has had to extend its borders in every direction. To indicate how the company has prospered it is only necessary to state some of its work last year.

LAST YEAR'S OPERATIONS.

Two launches of 80 ft. and 85 ft. respectively were launched; the engineering work in connection with Sir Paul Chater's new house, the new King Edward Hotel, Jubilee Hospital, etc., were taken in hand; engines and boilers were exported to the Philippines, Foochow, the French colonies, Borneo, Port Darwin, and other places; several government contracts were carried out—the company is now engaged in the manufacture of new standard weights and measures for the treasury; an aerial rope tramway is being built for the dairy farm; a large number of vessels in the port have had their machinery overhauled, including the South African transport *Incula*—and that is but a tithe of what the company is doing for the trade of the colony. Two steam launches are in the harbor always prepared to attend to the engineering wants of shipping in port, and the work is invariably carried out under European supervision.

A BUSY FIRM.

In a statement recently issued by the company it is remarked that, as one of the pioneer industries of the colony, George Fenwick & Co., Limited, have progressed not by leaps and bounds, but in a steady go-ahead manner which is the surest indication of reliability; all kinds of engineering work are undertaken; shipbuilding, either in steel or wood; engines and boilers; constructional work such as wharves, bridges, and roofs; electrical installation, and repairing work of all kinds. Many of the steam launches about the harbor of Hongkong are productions of this firm; the steel wharf from which the visitor embarks for Canton or Macao was erected by them; and if one desires to penetrate into the interior of China 200 miles above Canton, it may be done on a steel sternwheel steamer built by George Fenwick & Co., Limited.

IN THE FOUNDRY.

At present Hongkong is not in its busiest season, nevertheless the work shops at Wanchai are kept at full strength meeting the wants of the company's customers. A visit to the foundry, as it may more properly be called, shows over 100 Chinese workmen fully employed turning out engineering works ranging from a tael-weight measure to an 18-ton boiler. The layman who strolls around may not have a very technical idea of the character of the work in progress, but he cannot help realizing the extent of the business. The frontage to Praya East scarcely indicates the range of the buildings, which go fully a hundred yards to the rear and are occupied with boiler-shops, engine-rooms, storehouses, pattern-makers' shop, molders' and blacksmiths' buildings, and a variety of other houses such as are required in a foundry. To show the difficulties with which the workmen have to contend, it may be mentioned that when the last big boiler—an 18-ton affair—was shipped, the work had all to be done after midnight when the cars had stopped. But the Chinese coolies, with Europeans in attendance, managed to get the weighty apparatus to the sheer poles and ship it on board a steamer.

The question may be asked—How are Chinese trained as engineers? It was stated that the company take apprentices into their employment and give them a thorough training in one of the most highly skilled forms of labor extant. Engineering nowadays is a science, but a raw Chinese lad, who has hardly seen a machine in his life and has never handled a tool, who knows nothing about pattern-making or molding, drilling or other machines, picks up the business with wonderful perception. There are no labor leagues here, and no factory acts which compel employers to go to all sorts of expense and trouble to look after their employees. Yet during the thirteen years the present manager has been with the company he has not heard of a single serious accident at the works.

THE NEW BUILDINGS.

With regard to the new buildings at North Point, the plans show that a thoroughly modern engineering and shipbuilding yard has been the object of the company. There are large boiler and engine shops, power house, smithy, foundries for iron and brass, pattern-making establishment, molding shed, etc. A slipway is to be built for the accommodation of moderately-sized vessels. The main buildings will be of brick and corrugated iron, while the entire premises will be fireproof. On one side of the area occupied by the buildings an extensive wharf, at which the water is 20 feet deep at low tide, is in course of construction. Already the foundations for the new shear-legs are completed. The screw piles and columns are of special design, the object being that they may safely bear the very heavy weights which the shear-legs are expected to carry. The columns consist of iron cylinders five feet in diameter, filled with concrete, having hardwood driven piles 60 feet long clustered in the centre. The other piles are screwed into the bed of the harbor. The new shear-legs are capable of lifting a weight of 40 tons; they will rise to a height of 65 feet, and be able to traverse a distance of 35 feet. Naturally, steam will be the driving force employed. The shear-legs at Wanchai have a lifting power of 26 tons, so that the new apparatus will be capable of lifting nearly twice that weight. It is probable that the old shear-legs will be sold. As previously indicated, the new premises are not expected to be ready for occupation for a year or more. Messrs. Leigh and Orange are the architects.

The management of the company is in the hands of Mr. W. G. Winterburn, who has been thirteen years with the firm, and there are several Europeans in charge of the different departments. The best evidence that the company is in a satisfactory condition is to be found in the fact that the shareholders have now been receiving a dividend at the rate of 15 per cent for several years.

MALAY STATES' DEVELOPMENT

According to statistics recently compiled by the Secretary of the Government of the Federated Malay States considerably less money was spent in 1903 on the construction of roads, streets, and bridges than in the two preceding years, Selangor and Negri Sembilan being the states chiefly affected. The total mileage of roads, including bridle-paths, is 2,162. The railways earned $3,685,834 in 1903, and made a profit of 6.06 per cent on capital; but this sinks into insignificance beside the figures of 1894, when the profit amounted to no less than 28.92 per cent. The mileage increased from 118¼ in that year to 339 in 1903.

THE RAUB AUSTRALIAN GOLD MINES

(Continued from page 18.)

of 1902, we engaged on various prospecting drives and crosscuts on the east side of Koman hill, in search of a more easterly line of lode of which superficial indications existed. This work resulted in the discovery of a strong body of low grade quartz, on which we drove north for 174 feet and south for 154 feet without any break, the width varying from 2ft. to 4ft., and the assay value from ½ dwt. to 4 dwt. This was very cheaply done, and it proved to demonstration the existence of a new lode as had been suspected. Stoping from this was never in our minds, the level being too shallow. The knowledge that we had over 300 ft. of continuous, strong gold-bearing reef was sufficient for the moment.

The main crosscut, which has been called the East Adit, was driven in all 353 ft. westward into Koman hill, and intercepted some further small veins of no immediate importance.

Early in 1903, when developments in Koman Shaft at the 340 level were upsetting the theory of "no gold below 200 ft.," there was a revival of the proposal that the Government should join hands with this company in sinking a deep shaft, which would determine whether or not the gold-bearing lodes of Pahang were to be counted on in depth; and inasmuch as Koman Shaft could not be availed of for such a test, being ill adapted as to situation, capacity and equipment, a new site had to be chosen. Everything pointed to the east side of Koman hill—plenty of space for headgear, good ground for sinking in, dumping room for waste rock, facility for automatic delivery of ore to battery, proximity to a new lode on the one side and easy access to the old one on the other side by crosscuts which would disclose further lodes if existent.

Aiming at the greatest economy combined with an efficiency which would meet either case, we utilized to the full the facilities afforded by the East Adit and the north drive on the new lode, and connected there with a small air-shaft on the site to be occupied by the future main shaft. Once the connection was made we were able to strip down the air-shaft (6ft. x 4ft.) until it measured 18ft. x 5ft., sending the dirt down and out through the adit instead of raising it by bucket. This, for the depth of 86ft.—the level of the adit below the collar of the shaft—meant a very large saving.

Below that depth, all rock (and water) had perforce to be raised to grass; but, while the stripping was in progress, we were preparing a light headgear and steam winding machinery, and so the work went on almost without intermission. By November last, however, the inflow of water became greater than could be conveniently or economically dealt with even by the largest bucket (about 60 gal.), and we were compelled to stop sinking until the arrival of an electrically-driven sinking pump from England.

The contract between the Government and the Company concerning the shaft was signed on the 28th of January. Its main provisions are that (*a*) towards a shaft 1,500ft, deep the Government will contribute by monthly instalments one half of all costs up to $150,000.00 for its share; (*b*) all gold won in the prospecting work alone, after paying the Company for milling and a royalty of 10$^0/_0$, is to be sold for joint account; (*c*) so long as sinking be not unduly hindered thereby, the Company may use the shaft for any purpose of its own at all times; (*d*) control rests exclusively with the Company; and (*e*) whenever the sinking is stopped, the Company may take the jointly-purchased machinery for half its valuation at that date. The whole spirit of the contract is most fair and business-like.

TABLE OF MILLING RETURNS.

		1903.	1902.
Koman ore milled during year....	tons	31,043	21,108
Hitam ore " " "	"	4,359	11,423
Total ore " " "	"	35,402	34,727
Total ore—monhtly average......	"	2,723	3,278
Duty per stamp per 24 hours......	"	2,804	3,157
Average lost time per month	days	3,636	2.12

(Continued on page 38.)

ENGINEERING AND CONSTRUCTION

PERSONAL

Mr. S. S. Lyon, lately American Consul at Kobe, died there of apoplexy in the 58th year of his age.

Mr. Frank Mills, Assistant Engineer of the Federated Malay States Railways, has been promoted to District Engineer.

Mr. W. R. Pierce, Municipal Engineer of Singapore, has returned to his station and duties, after a vacation in England.

Mr. E. Chin Seng, a native Chinaman of the Straits Settlements, has contributed $3,000 to the fund for founding a Straits Medical College.

Mr. Raymond Halls has been appointed an Assistant Engineer in the Negri Sembilan Extension of the Federated Malay States Railways.

Mr. W. E. Allen, of the staff of the Chinese Engineering and Mining Company, sustained a broken leg recently while riding in North China.

Mr. T. Heslop Hill, Protector of Labor of the Federated Malay States, now in Madras on duty, is expected to continue in India until about April of this year.

Mr. H. N. Ridley and Mr. R. Derry have been appointed members of the Standing Committee for Agricultural Shows in the Straits Settlements during the present year.

Mr. Hugh L. Smith has been appointed representative at Chefoo, China, of the general management of the Transvaal Chamber of Mines Importation Agency, Limited.

Mr. P. T. Taylor, of Sydney, now represents in New South Wales the Meilink Manufacturing Company, of Toledo, Ohio, U. S. A., makers of deposit vaults, safes, etc.

The official title of Mr. G. W. Fryer, Engineer for Construction, F. M. S. Railways, has been changed to Chief Resident Engineer for Construction, F. M. S. Railways.

Mr. Henry W. Peabody, of the great exporting firm of H. W. Peabody & Co., Boston, New York, and London, accompanied by his wife, has sailed for New York via Suez.

Messrs. Brown & Brown, of Pyrmont, Sydney, have been appointed New South Wales agents for the structural materiai manufactured by the Carnegie Steel Company of America.

Mr. Conger, the American Minister at Peking, has notified the Chinese Government that the United States desires to establish a consulate at Chun-chen, Szechuen Province, China.

Mr. A. W. Watts, formerly located in Tientsin, has assumed charge of the shipping department of the Chinese Engineering and Mining Company, at Shanghai, vice the late Mr. Fullerton.

Mr. George C. Delmar has assumed the management of the Sydney (Australia) branch of the New York Export and Import Company, recently opened in that city at York Chambers, Market street.

Mr. Montgomery Schuyler, the new American Consul-General at Bankok, passed through Manila about three weeks ago en route to his future post. Mr. Schuyler formerly occupied the post of secretary to the American Ambassador at St. Petersburg.

Messrs. Valdimir Lorenc and Victor Lorenc, engineers of Budapest, Hungary, have been granted the privilege of making, selling, and using an invention for "self-regulating driving gear particularly applied to motor cars," within the Hongkong Colony, for a term of fourteen years.

Mr. Proust, manager of the Malaysian Company, according to the *Malay Mail*, has been ill with choleraic malaria. Mr. Dubois is in Raub Hospital recovering from typhoid, and Mr. Steele, one of the Raub electricians, who has completely broken down, has gone to Singapore for treatment.

Mr. F. H. Grinlinton, after making a thorough study of the survey systems of the Federated Malay States, speaks in the highest terms of praise of the Survey Department of Selangor. He also says that during his experience of thirty-five years in the East he has never seen a country where agricultural prospects were brighter.

Mr. Julius G. Lay, the successor of Mr. McWade as American Consul-General at Canton, arrived in Manila, accompanied by Mrs. Lay, aboard the army transport *Thomas*, and has proceeded to his new post. Mr. Lay has been in the consular service of the United States for more than fifteen years, the last five of which he spent in Barcelona, Spain.

Following are the authorized architects of Hongkong, under section 7 of the Public Health and Building Ordinance, 1903, as published in the *Official Gazette* of the Colony in January, 1905: Messrs. H. W. Bird, G. Blood, J. F. Boulton, A. Bryer, W. Chatham, W. Danby, A. Denison, H. G. C. Fisher, C. H. Gale. L. Gibbs, A. E. Griffin, B. B. Harker, E. M. Hazeland, A. H. Hewitt, A. H. Hollingsworth, A. Shelton Hooper, P. N. H. Jones, W. P. Lambert, J. E. Lee, J. Lemm, D. Macdonald, J. Orange, A. H. Ough, T. L. Perkins, S. J. Powell, E. A. Ram, C. H. Rew, C. B. Thomas, H. P. Tooker, A. Turner, C. Warren, Wong Fat Son, Wong A. Cheong and A. Wright.

DEATH RECORD

The death of Mr. H. A. W. Aylesbury, of Perak, is announced. He was the senior partner in the firm of Aylesbury & Garland, of Tapah.

Mr. Robert Anderson, Superintendent Engineer and Manager, respectively, of the Prye River Dock Company, and subsequently manager of Keppel Harbor Dock, Singapore, died at Penang the latter part of January. He was well known in engineering and shipping circles of the East.

Recent Shanghai papers chronicle the death of Mr. George Fullerton, of the Chinese Engineering and Mining Company of that city. Mr. Fullerton was well known on the China Coast and universally esteemed. He had been feeling unwell, and on the morning of January 5th remained indoors instead of going to his office. Some papers were sent round to him in the course of the morning and he signed them. Later, still feeling poorly, he sent his boy to the club for some ice, and it was on returning from this errand that the boy found his master lying on the bed dead. A book he had been reading had fallen on the floor. Death apparently was due to heart failure. Mr. Fullerton, who was Shanghai-born, was some years ago in Messrs. Butterfield & Swire; he went to Hongkong, and resided there for some years, and latterly had been identified with the interests of the Chinese Engineering and Mining Company

RAILWAYS, SUPPLIES, ETC.

PORT ARTHUR RAILROAD.—Advices from Tokio announce that the railroad between Changlingtse and Port Arthur has been repaired by the Japanese and was opened to traffic on January 15th.

KOWLOON-TO-CANTON RAILWAY.—Announcement was recently made in Hongkong to the effect that the present year will witness the beginning of the construction of the long-delayed Kowloon-to-Canton Railway.

PAINT CONTRACT AWARDED.—The Borneo Company, Limited, Singapore, has obtained the contract for the supply of Siderosthen paint to the Railway Department of the Federated Malay States, for the present year.

CHINESE FUNDS FOR RAILROADS.—The Shansi bankers in Peking are just now busily engaged in raising funds for the construction of railways in their province, so as to anticipate the Russian concessions proposed for that locality.

STRAITS RAILWAY EARNINGS.—The total receipts of the Singapore-Kranji Railroad during the eleven months of 1904 ending November 30th were $180,543 as against $120,417 realized during the corresponding period in the previous year.

RAILWAY CONSTRUCTION IN QUEENSLAND.—The Queensland Government has decided to construct railway lines with the object of opening up districts in which large areas of Crown Lands are at present unoccupied, to make the land available for closer settlement.

STEAM TRAM SERVICE WITH SYDNEY.—The people of Balmain are endeavoring to obtain a more direct tram service with Sydney. Given the necessary authority, a syndicate is ready to be formed to construct a private line. The proposed motive power is steam.

CHINESE RAILWAY PROJECT FAILS.—A Chinese request of the Peking Government to be allowed to bnild a railroad to carry coal from the Western Hills to Peking has been refused, partly on the ground that the capital proposed to be raised, Tls. 200,000, was insufficient, and partly on the ground of illegality.

LOCOMOTIVE CONTRACT.—Messrs. Robert Stephenson & Co., Limited, of the Springfield Locomotive Works, Darlington, have been awarded, in the face of severe competition, an order for ten large 4-wheeled coupled passenger locomotives, with 4-wheeled leading bogie and 6-wheeled tenders, for the Shanghai-Nanking Railroad.

HANOI-YUNNAN RAILWAY.—Advices from Indo-China are to the effect that the French Railway between Hanoi and the Yunnan frontier, via Liaoshanhien, will shortly be completed, when work on the French Yunnan Railways will immediately begin. The survey of these lines has already been made, and the route decided upon.

AMHERST-MOULMEIN RAILWAY PROJECT, BURMA.—One of the railway projects contemplated in Burma is a line between Amherst and Moulmein, which will bring a pleasant seaside resort within three hours' journey of the latter place. It will later on be extended to Ye and Tavoy, which will open up a large country to trade and cultivation.

AMERICAN RAILWAY TRUCKS FOR CHINA.—The Quong Tuck Company, of Seattle, Wash., has secured an order for equipment for construction of a new railroad in China to run from Sun Ning northward into the Province of Canton. Ultimately the line will be extended to Fuchan, to connect with a line running to Canton. American equipment is to have the preference.

Railway Extension in China.—The Board of Commerce of the Peking Government has formulated plans for the building of certain railways in Fokien Province. It is proposed to build a railroad from Foochow to the Chao Chou-Swatow line, which is already in course of construction. It is reported that the principal shareholder in the enterprise will be a millionaire Chinese named Lin, who is regarded to be the wealthiest native of that province. Lin also has valuable possessions in Formosa.

Steel Rails for Rangoon.—The steamer *Vimeira*, loaded by Barber & Co., of New York, has sailed from Baltimore with 14,631 steel rails, valued at $75,000, for Rangoon, India. This is the second full cargo of rails shipped to that place since December 1st, the *Firth of Dornoch*, which sailed from New York on that date, having taken a similar cargo. Another steamer, the *Vittoria*, is due shortly at Baltimore to load for the same port, and it is understood that a fourth vessel will soon be chartered for another large shipment.

Seoul-Fusan Railway.—It is announced in Korea that the Seoul-Fusan Railway has proved rather a failure thus far owing to the rapidity with which the track has been laid and the instability of the wooden bridges erected. The journey from Seoul to Fusan occupies more than twenty-four hours in consequence. It is hoped that at a near future date the wooden bridges will be replaced by iron structures and that then the distance of 275 miles between the two terminals will be covered in a little less time than eleven hours.

Another Railroad for Burma.—In addition to the railway program sanctioned for Burma, the Lieutenant-Governor, Sir Hugh Barnes, has recently suggested to the Government of India the immediate construction of a Southern Shan States railway. It would be a narrow gauge line from the Mandalay Railway to Tannggyi, a distance of 112 miles, costing about $2,750,000. The line would open up a fertile region suitable for planting and mining enterprises. The project is warmly supported by the mercantile community at Rangoon.

ELECTRIC LIGHTING, TRACTION, POWER, ETC.

High Level Tram Pays Dividend.—In 1904 the Hongkong High Level Tramway paid a dividend of 15 per cent and carried a surplus of $20,000 to reserve.

Kawasaki-Kanazawa Tramway, Japan.—The Minister for Home Affairs has granted permission for the construction of an electric tramway between Kawasaki and Kanazawa.

An Electrical Adviser.—The Government of India is to have an Electrical Adviser whose office will be appointive. He will be required to render advice to local governments, state railways, municipalities, and district and local boards.

Mono-Rail Tramway for Simla.—Simla is about to lead the way in India in connection with mono-rail traction. The Municipality of that place has voted funds for the construction of a tramway on this principle from Sanjoull to the Simla Ridge.

Electrical Installation Fittings, Shanghai.—The Municipal Council of Shanghai has opened bids for furnishing the city with the following electrical installation fittings: Incandescent lamps, 16,500; electric fans, 271; vulcanized wire, 27,528 yards, together with 73 switches, 28 electroliers, 130 brackets, 501 shades and 90 lampholder adopters.

Ceylon Mineral Thorianite.—The new Ceylon mineral thorianite is bringing £30 per cwt. because of the thorium it contains. There is to be no royalty, and planters are anxiously exploiting the new "T" which may be a rival to orange and broken pekoe, in the future. Thorium is a rare metal resembling aluminum occurring in thorite, an equally rare mineral found in Norway. It is used in making the mantles for incandescent lights.

Penang Electric Light Extension.—The electric light plant and mains of Penang are to be extended so as to provide supply for the tramway, and also private consumers in the Sepoy Lines District. The extension includes the provision of a 300-kilowatt steam dynamo and the necessary additions to boilers and steam pipes at the generating station; a sub-station equipped with a tramways motor-generator and balancing plant at Western Road, together with the necessary cables. The cost of these additions is estimated at £9000.

Electric Light Company, Brisbane.—The City Electric Light Company, Limited, has been registered at Brisbane, Queensland, with a capital of £100,000, in shares of £1 each, to take over and continue in all its branches the electric lighting business of the Brisbane Electric Supply Company, Limited. The registered shareholders are Edward John Holmes, Edward G. C. Barton, William J. Young, William M. E. L'Estrange, Alfred Ward, Catherine Ward, John F. Church, John T. Isles, Theodore Unmack, Sydney C. Lecky, and Edward Gaffney.

Opening of Singapore Tramways.—It is the present intention of the constructors of the tramway lines in Singapore to complete them so that they can be opened to the public service some time next month. Messrs. Dick Kerr & Co.'s staff is making gigantic efforts to get the power-house, the line, cables, etc., completed, and the cars have arrived. Mr. L. D. Tandy, of the firm of Vincent & Tandy, London, has been appointed manager of the company to work the tramways. Mr. John Anderson will be a director, and Sir Frank Swettenham has been asked also to join the board.

Lighting of Adelaide, S. A.—The lighting of Adelaide is again under discussion by the city fathers. Five years ago they gave the South Australia Electric Light Company the right to carry wires through the city on condition that it erected and maintained free of cost to the council 30 arc lamps of 2,000 c.p. each in the principal streets. This contract expiring in January, the council recently invited tenders for the lighting of the streets so supplied. It received three tenders, one from the present suppliers, who quoted £640 per annum; another from the South Australia Gas Company, whose price was £864; and a third from the Kitson Light Company who was not prepared to undertake the work for less than £1334. It was decided to accept the lowest tender.

Immense Tramway Contracts.—The London branch of J. G. White & Co. has secured two of the biggest tramway contracts ever obtained. The London office was established several years ago, and has carried out various important works, including the construction of the permanent way of the London County Council Electric Tramways. One of the two contracts now secured is for the reconstruction for electric traction of the whole horse tramway system of Belfast, at an inclusive price of £545,404. There will be numerous sub-contracts, as the White concern does not make steam and electric machinery or tramway cars, their specialty being the permanent way. The work is to be completed within nine months. The same company almost simultaneously secured a contract for reconstruction of the Montevideo tramways, also at present worked by horses, and the figure is about £450,000.

WATERWORKS AND IRRIGATION

Port Dickson Reclamation Works.—A sum of $10,000 will be spent within the next year on the reclamation works at Port Dickson, Straits Settlements.

Rangoon River Survey.—The Burma Government has allowed an expenditure of Rs. 48,800 by the Rangoon port commissioners for the survey of the Rangoon River.

Sarawak (Borneo) Waterworks.—The Sarawak Estimates for 1905 show an expected revenue of $1,054,140 against expenditure of $1,270,497. Of the expenditure $218,745 composes a fund for the construction of a new city waterworks plant.

Harbor Improvements at Auckland.—Extensive harbor construction work is being done at Auckland, New Zealand, the total outlay proposed being in excess of a million dollars. A new railway wharf will be constructed by the Ferro-Concrete Company, at a cost of $215,000.

Newcastle Sewer Scheme.—The sewerage scheme at Newcastle, N. S. W., is being pushed ahead a little more rapidly, an extra £1000 per month being provided by the Government to afford employment to men who cannot get work at the collieries owing to the slackness of trade.

Wharfage Improvements at Dunedin, N. Z.—Considerable improvements are to be made to the wharfage accommodation at Dunedin, N. Z., necessitated by the large ocean-going vessels coming up the harbor to the city. The Harbor Board's engineer is preparing plans and specifications.

Madras Irrigation Projects.—The Government of India has been dealing very fairly with Madras so far as new irrigation projects are concerned. It was feared that the provinces in the north, especially the Punjab, would be unduly favored in the matter of funds, but so far this has not been the case. The Government of India have just sanctioned for immediate execution the big Maupad tank project in Nellore District, which is estimated to cost Rs. 12 lakhs; and it is also stated that the Government of India is about to sanction an estimate for a large pumping station which will provide irrigation for Divi Island in the Kistna District. Both of these projects are excellent in their different ways, and the Government of India's sanction of them augurs well for the fate of the other big and small irrigation projects that have been under consideration by the Madras Government.

Ship Building in Victoria.—At the works of the Australian Forge and Engineering Company, Prop. Ltd., of Williamstown, a 100-ton steel barge is being built for the Adelaide Steam Tug Company. This is the second largest vessel ever attempted in Victoria, the largest being the dredge *John Nimmo*, built for the Victorian Government some 18 years ago. The new vessel is 180 ft. long, 32 ft. beam, and 14 ft. deep. Pneumatic machinery is employed to do all the drilling, riveting, and caulking required. Some time ago the Public Works Department placed an order for a new dredge in Glasgow, the plans having been prepared by the officers of the department. Copies of these plans were retained, and the Premier has now promised that, given the consent of his colleagues in the Ministry, he will invite tenders locally for a second dredge with a view of providing employment for the iron trade, which in Victoria, as elsewhere, is very slack at the present time.

Punjab Power Association.—Sir Thomas Higham, late Public Works Secretary to the Government of India in the Irrigation Branch, has returned to India, says *The Englishman*, and is now in Lahore to represent the interests of the Punjab Power Association. This association of British capitalists aims at harnessing the enormous water power, especially from the great irrigation canals now running to waste in the Punjab, and to employ it in generating electric power for public and private lighting, and for mechanical propulsion. One of the first objects contemplated is to bring to Lahore and also to Amritsar, both very busy and increasingly important centres of commercial activity, the immense boon of a cheap and ample supply of permanent electrical power. Negotiations with Government with a view to obtaining the necessary concessions are now understood to be in progress. Major-General Beresford Lovett, R. E., of Simla, is at present on a visit to England, and has been appointed Secretary in India of the Punjab Power Association.

Pearl's Hill Reservoir, Singapore.—There having been certain discussions of late as to the structural design and condition of the new service reservoir at Pearl's Hill, says *The Straits Times*, we have obtained from an experienced and highly qualified authority, not connected with either the Municipal or the Government service, an independent opinion of general practical value. The substance of that opinion, whose exceptional value would be widely recognized if we were at liberty to mention the name, is to this effect. In regard to the Reservoir, which is declared to be structurally a fairly creditable job, both in the materials used and the workmanship, he finds that the only mistake made in his opinion was that it was not "formed" or sunk more into the hill, the desire to obtain the greatest "head" (pressure) possible being supposed to be the reason for the existing arrangement. The leakage from the reservoir is stated to be not more than might reasonably be expected if the more or less adverse conditions existing in the colony, particularly with regard to the class of labor available, be taken into account. The leakage "visible" can be easily and effectually stopped. The leakage "nonvisible," that is into the hill, may not be so easily located, but its stoppage is neither impossible nor expensive and it would in no way detract from or materially affect the capacity of the reservoir. On the whole, from personal observation as an engineer, he fails to find the slightest cause for alarm or anxiety in respect to the stability of the reservoir, or as regards the involving of further heavy expense.

BUILDINGS

New Government Printing Office.—A new Government Printing Office is to be built soon at Singapore, at a cost of $48,250.

New Government Offices.—New Government offices will be erected very soon, at a cost of $20,000, at Kuala Pilah, State of Negri Sembilan, F. M. S.

Taiping Goal Enlargement.—The Government of the Federated Malay States has set aside on the Perak estimates for 1905 the sum of $89,000 for the purpose of extending the Taiping goal.

Kuala Lumpur Market Extension.—Howarth Erskine, Limited, of Singapore, have secured the contract, through the Federated Engineering Company, Limited, of Selangor, for that portion of the Kuala Lumpur market extension which is to be undertaken this year.

Government House, Singapore.—Expenditures to be incurred this year on Government House, Singapore, have been provided for as follows: Electric lighting, improvements and repairs, $20,000; painting, whitewashing and repairs, $5,000; regrading roof, $2,500; extension, on an estimate of $261,000, $120,000; syces' quarters, $3,000; repairs to drains, $2,000; wire fencing, $550.

BRIDGES

Krian River Bridge Extension.—The Krian River railway bridge is to have a 100-foot span added to it at an expenditure of $63,300.

Repairs to Bridle-Path Bridges.—Messrs. W. H. Tate & Co. have secured the contract for renewals and repairs to Bridle-Path bridges in the Larut and Matang Districts of the Federated Malay States.

New Bridges for Bangkok.—Tenders for two new bridges were opened at the Public Works Department in Bangkok in January, and Belgium firms gave the lowest quotations. These structures will replace existing bridges, one at Klong Poh Yome and the other at Tapan Han—the city end of Sampeng. Following were the tenders: Larini Nathan, Milan—Klong Poh Yome, £140; Tapan Han, £300. Messrs. G. Kluzer & Co., for an Italian firm—Klong Poh Yome, 3,695 francs; Tapan Han, 5490 francs. Usines de Braine-le-Comte, Belgium—Klong Poh Yome, 2500 francs; Tapan Han, 5500 francs. For the two bridges taken together 7500 francs, which was the lowest tender for the two structures.

PUBLIC WORKS

Bunding a Siam River.—The work in connection with the bunding of the Consulate River frontage at Bangkok, which suffered recently by the high water, has been resumed since the return to the Siamese capital of Mr. Flores, the Consul for Portugal.

Yokohama Harbor Dredging.—The work of dredging Yokohama Harbor, which has been in progress some time, is now finished, and vessels with a draught of 35 feet can easily be accommodated. The Chamber of Commerce report says that the gigantic *Minnesota*, of the Great Northern Steamship Company, will find ample room for anchorage.

Pahang-Kuantan Canal.—The proposed canal to connect the port of Kuantan with the Pahang River, in the Federated Malay States, has been indefinitely abandoned, as it is considered that it would not be a success. The annual floods, which cover miles of country, would, it is believed by the officials, have proved fatal to the success of the scheme.

Blat Cart Road, Pahang.—Mr. G. M. Donald has obtained the contract for the Blat Cart Road, Pahang, and work on the highway has been commenced at the Kuantan end. Tamil labor is employed. The new road is to be opened in connection with Towkay Loke Yew's valuable mining concession in Blat and Puhoi divisions of the coast. The road will be about fifteen miles in length. It starts from Godown Rasau on the Kuantan River and leads on to Kampong Blat on the river of that name. Valuable tin land will be rendered easily accessible by the new highway.

Canton's Proposed Drainage System.—The whole of the principal thoroughfares of Canton are just now strewn with material excavated by order of the Municipal Council in an endeavor to put down drains. The sewer system consists of open flush drains covered in at designated places, such as crossings of paths, doorways, etc. These drains are run alongside residences, and fumes may come direct to your rooms. Dark nights, although the drains are partly railed in, one may very easily come by accident into the open work through which the drainage is supposed to run. Buildings are being run up on every available space and rents are enormously high.

New Harbor for Madras.—According to dispatches the sanction of the British Secretary of State for the Colonies has been received to the proposals for financing the Madras Harbor Improvement Scheme. The project provides for the closing of the present harbor entrance, and the opening of another in the north-east wall, protected by a breakwater about 1200 feet long. The cost of the scheme is estimated at £45 lakhs, and the following are the conditions imposed by the Home Government with regard to the raising of the sum: (1) A grant of Rs 20 lakhs will be given from the imperial revenues, the payments being distributed over four or five years. (2) The balance of the sum required, not exceeding Rs 40 lakhs, will be lent to the Harbor Trust Board at 4 per cent interest. (3) It will be payable in sixty years by equal annual instalments. (4) If in any year the Trust is unable to provide from its revenues or balances, the full amount required for the service of the loan, the Local Government shall make good the deficiency, their liability being, however, restricted to the maximum of half the annual sum necessary for the service of the loan, the right to recover such payments from the Harbor Trust Board being reserved to the Local Government; and (5) the terms of the repayment of existing loans shall remain unchanged, that is, that outstanding loans shall not be consolidated with the new loan, and repaid in sixty years from the present date, as proposed.

Selangor Estimate for Public Works, 1905.—The principal items of expenditure for this Malay state are public works, $2,339.357, and surveys, $194,212. A new lunatic asylum, which is to cost $300,000, will be entirely paid for by the Federal Government. Following are a few of the larger items for Kuala Lumpru and district: Electric light works (estimated cost, $880,000), $295,000; back lanes (to complete), $105,000; post office (1st vote), $50,000; Bentong Road (1st section), $75,000; Petaling Road, $75,000; town roads (reconstruction), 75,000; new town roads, $25,000; importation of labor, $30,000; electric light, Gov. quarters, $40,000; roads and streets (maintenance), $173,575; waterworks (special expenditure) $96,650; rifle range, $12,000. A couple of thousand dollars have been voted to prepare drainage plan for that part of Kuala Lumpur lying to the east of the Klang and Gombak rivers. One hundred and eighteen thousand dollars will be devoted to the better lighting of Klang Straits which will make the passage more attractive to ocean-going steamers. Twenty-six thousand dollars are to be spent on enlarging the cattle quarantine station. The amount to be spent on new roads, bridges, etc., in the different districts, is as follows: Ulu Selangor, $123,700; Ulu Langat, $72,250; Kuala Langat, $67,612; Klang, 51,000; Kuala Selangor, $11,900. The Ulu Selangor estimates include $40,000 for the Pahang Trunk Road improvement, and $24,000 for an iron bridge at Batang Kali on the main north road.

SHIPBUILDING, MARINE, ETC.

Steamship Construction in Penang.—The first steel steamship to be built in Penang is now under construction at the Prye River Docks. She is 95 feet in length by 18 feet beam, and depth of 7 feet, 10 inches. She will probably be launched before March 1st.

Gasolene Schooner for South Sea Trade.—A new gasolene schooner for the South Sea trade has been ordered by Williams, Dimond & Co. of San Francisco for the Jaluit Gesellschaft of Germany. It will be 106 feet in length, and is to be equipped with a Union engine of 125 horse-power, one of the most powerful ever built on the Pacific Coast, possessing three cylinders and of the latest type, fitted to run on either gasolene, distillate or kerosene. A complete electric lighting plant will also be installed.

New Japanese Steamships.—The Mitsu Bishi DockYark and Engine Works of Nagasaki, Japan, are to build two 15,000-ton steamships for the Toyo Kisen Kaisha's service from San Francisco to the Orient. The other Japanese steamship company, Nippon Yusen Kaisha, is having built at the same place a 6,000 ton steamer for its Seattle service. Material for these new steamships and six others is being bought in the United States, and shipments are now being made from San Francisco. Locomotives, rails and also material for the new waterworks at Yokohama are also being shipped, the purchases having been made in America partly on account of the prices and in part due to the speedy delivery.

Australia-Manila Line via Honolulu.—It is said that a movement is on foot to establish a line of steamers between Anstralia and Honolulu with Manila as a port of call. The proposed service will be a monthly one from Fremantle, Western Australia, via Honolulu, Yokohama, Hongkong, and Manila. It is understood that at the Honolulu end the American Trading Company is behind the scheme.

Tug Boat for Manila Firm.—A new tug boat for the Manila firm of Macondray & Co. lies off Fort Santiago at the delta of the Pasig River, nearly completed. The building is being done by the San Nicolas Iron Works, of this city, and the cost of the boat will approximate -P-25,000 Philippine currency. Captain H. P. Gregory is supervising the completion of the work. The new craft is designed to be the most powerful tug boat in this port and will have a speed of 15 knots.

At Anchor with Fires Out.—A French newspaper correspondent, who paid a recent visit to Canton, regretted to see the *Paul Beau* and *Charles Hardouin*, two vessels put on the Hongkong-Canton run in opposition to the English boats, at anchor, with their fires out. He trusted that they would soon be working again under a better organized plan, the original one having been decidedly defective. It is said that the Messageries Maritimes will take up the business.

Raising Sunken Ships at Port Arthur.—Advices from Port Arthur are to the effect that the Japanese engineers there in charge of salving the Russian warships lying on the bottom of the inner harbor, are developing a gigantic engineering scheme by which the disabled ships may be repaired where they lie and then floated. The inlet to the inner harbor is being dammed by a sea wall. The water will be pumped from the section of the harbor thus isolated and the warships repaired. Afterwards the water will be turned back into the harbor and the ships thus floated.

Powerful Tender in Construction.—The S'hai Tug and Lighter Company is having a very powerful tender built at the works of S. C. Farnham, Boyd & Co., at Shanghai, under the supervision of Mr. R. B. Mauchan. She will be divided into three separate water-tight compartments, being 150 feet long, 22 feet beam, drawing 10 feet, 6 inches aft and 5 feet forward, steam stearing gear, electric light, and a notable feature of the craft will be a handsome smoking saloon, located aft. She is due to be finished in June, and will prove one of the most complete and up-to-date tenders in the Far East.

Powerful Dredger for New Zealand Work.—Messrs. William Simons & Co., Limited, of England, have just finished a very powerful dredging vessel of their latest design, for work in New Zealand. Besides being fitted with a special set of buckets for dredging rock ground, the vessel is fitted with a sand suction pump. The buckets as well as the suction pipe are made to dredge to a depth of forty feet. The hopper is arranged in such a manner that the dredgings can be relifted from the hopper and discharged over the side by a special patent arrangement of the builders, and delivered ashore through a long line of floating pipe for land reclamation, or into barges moored at the side of the dredger. Ordinary hinged doors are also fitted to the vessel's own hopper, so that the material can be deposited at sea when required.

New Steam Launches, Kobe.—The *Shioya* and the *Fearless*, owned by Messrs. J. Lyons & Co., are the latest additions to the steam launch fleet in the harbor at Kobe. The *Shioya* is a magnificent vessel specially built for the large increase of passenger traffic at Kobe, and she is also fitted for use as a pleasure boat for cruising in the Inland Sea. She has birth accommodations in the cabin for four persons, with a good toilet room, etc., and there is seating accommodation for about 100 persons on deck. The vessel was built by Messrs. E. H. Hunter & Co., of Osaka, and is considered about the fastest launch in the harbor. The *Fearless* was built by the Ise Iron Works, of Hyogo, and is also a fine tug. She is very powerful, has a good beam, and there is ample room on her deck for a large number of passengers.

Motor Launch for Mindanao.—Messrs. Moxon & Kew, of Hongkong, recently constructed and delivered to the purchaser, Mr. Carl W. Wantz, of Iligan, Mindanao, P. I., an 8-horse power motor launch bearing the name of *Paula*. She is a novel little craft and very swift. The motor was obtained by the Hongkong firm from England, and fitted into a boat—something after the pattern of a life boat, with high bow and broad sides—built in Hongkong. The boat is 29 feet, by 7 feet, by 3 feet, 6 inches. The motor is driven by petrol, which means an expenditure of about 60 cents an hour, the boat running at full speed. The motor is so simple that a child can work it. When the motor is stopped, consumption of petrol ceases, and even if the boat is stopped for a month it only takes two seconds to set it running again. The *Paula* can carry thirty passengers, or about three tons of merchandise. Messrs. Moxon & Kew are now building for a firm in Hongkong a motor launch 70 feet long, which will carry sixty passengers and thirty tons of cargo on a draft of three feet. A 60-foot launch is also being built to carry four tons of cargo and sixty passengers on a draft of 18 inches.

MISCELLANEOUS NOTES

Porcelain Exports from Japan.—The porcelain exports from Japan to the United States during 1904 amounted to about Yen 525,000.

Match Factory for Peking.—The Board of Commerce of the Chinese Government is arranging to establish an immense match factory at Peking.

White Lead Manufactory.—The Australian White Lead Manufactory has been registered under the Firms Act, with the object of carrying on in Footscray, Victoria, the manufacture of white lead.

Contract for Gas Mains.—The contract for furnishing fifteen miles of gas mains to the Honolulu Gas Company has been awarded to the Honolulu Iron Works in competition with firms in the United States.

Ceylon Exports Rubber Seeds.—Ceylon is exporting rubber seeds to Rangoon and Hongkong. The *Times of Ceylon* announces that rubber prices offering in London are so high just now there is no likelihood of any rubber being available in Colombo for some time.

Japan Prohibits Tobacco by Mail.—The postal administration of Japan has advised the Washington Government, which included the Philippines, that the importation of manufactured tobacco by parcel post is prohibited unless it shall be made by order of the Government or by virtue of the permission previously granted by the Government for personal use on account of health or habit.

Standard Oil at Nanking.—The Standard Oil Company has secured, through a Chinese representative, a large piece of land on the riverfront at Nanking, China, near what it is thought will in time be a foreign concession. At least two steamship companies are also arranging for permanent locations and there are signs that harbor improvements are about to begin. There is little question but that the city will soon be an open port.

War Booms Candle-Making in Japan.—The war in the north has given a decided impetus to the candle-making trade of Kobe, and the white-wax candle factories, numbering together about twenty establishments. Before the war the monthly output of candles in Kobe was about 10,000 catties of white and 9,000 catties of native wax, but now the output is 40,000 catties of white and 9,000 catties of native wax. The present output is valued at Y14,000, bringing a daily revenue from the industry of Y844.

IMPROVEMENTS IN PHILIPPINES

School Plans Paid For.—William Waters, Jr., has been paid -P-3,600 for his plans of the new school building to be erected in the Trozo District of Manila at a cost of -P- 120,000, being the prize offered by the Municipal Board for the best plans.

New Boulevard on Luneta Beach.—The Municipal Board has finally decided that the new boulevard along the bay front, from the Elk's Club to old Fort San Antonio Abad, Malate, shall have a uniform width the entire length of the improvement of 80 meters.

Railroad for Mindanao.—Among the many improvements the Government is planning for Mindanao is a railroad from Camp Overton to Lake Lanao, a distance of about twenty-two miles, to cost about $350,000. This will open up a most promising agricultural country.

Public Improvements.—The Civil Commission has authorized the following expenditures for public improvements: By the Department of Engineering and Public Works, -P-272,560; to Messrs. J. G. White & Co., -P 4239 for repairs to the Jolo Bridge, Manila; for the extension of the fire and police alarm system, -P-5000, and for the laying of temporary sewers, the widening of streets and the building of bridges in the city of Manila, -P-116,600.

Bridge over Manila Estero.—The Municipal Board of Manila has granted permission to the Manila Electric Street Railway Company to erect a bridge over Estero Concepcion to Isla Provisor, under the following conditions: The bridge when completed, right of way to both approaches and that portion of the company's land along the estero necessary for the widening of the east entrance to the canal, to be ceded to the city, together with a piece of land of definite width to extend from the property line of the company's holdings on Isla Provisor to Calle Marques de Comillas.

Manila and Subig Fortifications.—Work on the fortifications in Manila Bay and at Subig has been commenced. The Government is to expend $700,000 as an initial appropriation for that sort of work in the great defense project of the Philippines. It will require considerable time to complete the fortifications, the emplacements of which and the character of the batteries being regarded as a confidential subject. Orders have been issued from the War Department at Washington to allow no observations of the sites, and the greatest secrecy will prevail during the period of construction, It has been found that the old Spanish fortifications are worthless, and the American Government will be obliged to make these entirely new works.

Modern Lumbering in the Philippines.—The Insular Lumber Company of Manila has equipped a saw mill and other plants on the Guinaghon River, operated by American machinery which was shipped to Manila last September. The company has already secured a contract for 1,500,000 feet of lumber, to be used in improvements for Cebu harbor. Log-hauling railways are to be built through the forests in all directions. An arrangement has been made with the Philippine Construction and Transportation Company for the use of their light-draft barges to deliver the product of the mills at principal ports in the islands. Among the concerns which supplied the equipment are Clark Brothers' Company, Belmont, N. Y., and the Eberhart Manufacturing Company of Cleveland, Ohio.

Money for Moat Improvements.—The Civil Commission has authorized the expenditure of -P-15,000, Philippine currency, for constructing proper drains and bulkheads preparatory to filling in the great Manila moat with surplus material to be pumped from the harbor. The lowlands about the city hall will also be included in the drainage work, it being the intention of the government to raise the surface of the land in that vicinity by several feet. Before this improvement can be commenced the sewer pipes which are to drain the Walled City District must be laid for the disposition of the water which is now drained by means of the moat. The big pipes through which the mud will be transferred from the bay to the moat will cross the Malecon Drive. They will partly be underground and the part on the surface will be so bridged as not to interrupt traffic.

MINES AND MINING

Negri Sembilan Tin.—In 1904 the Negri Sembilan exported 84,849.58 piculs of tin (5,050 tons) against 85,465.54 piculs (5,087 tons) of the year previous.

Mining Leases Cancelled,—The Malaysian Company's leases for 621 acres of land in the Lips District have been cancelled, owing to non compliance with conditions.

Kinta Tin Mines.—During the year ended June 10th, 1904, according to the company's report, the Kinta tin mines produced 3,378 piculs of clean tin ore with the aid of seven monitors. This sold for £14,771.

Ulu Pahang Gold Output.—From the Ulu Pahang gold mines a total of 1,432 ounces of smelted gold were exported last November. The duty realized was $2,340, against $1,490 in October. The metal was produced in the following proportions: Raub Australian 1,260 ounces, Malaysian Bukit Malacca 44, Kechau Syndicate 71, Kechau Gold Fields 57.

Gold Discovery in China.—A gold mine has been discovered in the District of Hoi Kuin in the Prefecture of Siu Hing. According to the account of the natives there are two kinds of gold —field gold and granite gold. What they call field gold is alluvial, and the granite gold is dug from the mountain. Hitherto they have been using native implements, but now they are using foreign machinery at the mine. The work is under the supervision of Chan Mo Shun, a military mandarin.

Petroleum in Korea.—The Japanese Consul at Chinnampo, Korea, reports to the Tokio Government that the presence of kerosene has been discovered at a village about four miles from Phyongang in Kantong District, Phyongan-do. According to the opinion of some American experts who have inspected the district, the locality abounds with petroleum. There are also three large veins of coal in the Samteung District in the same province. Until recent years this coal had been worked by Koreans, who, however, could not make it pay.

Pahang Tin Product.—The Pahang tin export for November was 3,649 piculs, valued at $282,305 and paying a duty of $23,753. The total tin output for the state during the first eleven months of 1904 was 25,130 piculs, against 21,693 for the corresponding period of 1903—an increase of 3437 piculs. During the month of November the total output of tin was 44 tons at the Pahang Corporation's mines, at a working expense of $12,000—The Sipiau Tin Company obtained 122 piculs of tin ore in December, valued at $5,496, and the Belat Tin Mining Company has, the same month, an output of 86 piculs—The Kuantan Mining Syndicate reports an output of 36 piculs tin ore during December.

Prospecting in Tonquin and Laos.—The development of mine prospecting in Tonquin and Laos has rendered organization of a Mines' Service essential, and at the present time it is establishing in favorable circumstances under management of an engineer-in-chief, assisted by three comptrollers of mines and three geologists. The work of this department is to examine applications for grants and ascertain the mining districts of Indo-China. Its most urgent task is the production of a geological map of Upper Tonquin, a district towards which the efforts of prospectors are now directed.

Coal and Gold in Fukien.—In the Province of Fukien, China, coal and gold are both known to exist, within easy reach, offering most attractive prizes for the prospector and practical engineer, writes the American Consul at Foochow. With any encouragement on the part of the provincial authorities, immense supplies of both these articles could be got out, but the attitude of the higher officials is one of obstruction, applying almost equal to native and foreign promoters. The treaty provisions relating to mining by foreigners are nullified by unreasonable objections, and so it occurs that, while well-known rich fields of coal and gold, easily available, lie unworked and profitless. This is due chiefly to ignorance of mining methods, fear of the foreign promoter, and the conservative spirit which is such an incubus on all enterprise in China.

Penang Mining Notes.—The Malaysian Company has cut the reef to bottom level and the stone prospects satisfactory.—The auriferous prospects of the Raub field are described as hopeful.—Mr. René Proust, of the Malaysian Company, has gone through with the latter's gold escort.—The Kinta Company has sent another European prospector into the Temerloh District.—Messrs. Bibby & Mason are prospecting extensively near the new Bentong Road—A well-equipped Dutch party has arrived at Bentong, with all the necessary gear for thoroughly prospecting an area recently acquired in that vicinity.—Mr. Boerma's tin mining syndicate has made final arrangements with the Raub Company for high-pressure water-power for the company's dam at Sempam. The company intends to operate on an extensive scale.—It is reported that Mr. Warnford Lock contemplates leaving for home within the next few months. It is said that he will take up the position of consulting engineer to the Raub Company.

Kolar Gold Fields, India.—Following are the returns for the month of December, 1904:—*Balaghat.*—3,430 tons of quartz crushed yielded 2,656 oz., 2,380 tons of tailings cyanided yielded 237 oz., and collected from plates 622 oz., making a total yield of 3,515 oz. as compared with 2,679 oz. in November. *Champion Reef.*—Milled 16,100 tons which produced 15,402 oz. of gold. 13,637 tons of tailings treated by the cyanide process produced 2,098 oz. of gold, making a total production of 17,500 oz. as compared with 18,017 oz. in November. *Coromandel.*—1,620 tons of quartz crushed yielded 463 oz. and 900 tons of tailings cyanided produced 45 oz., making a total yield of 508 oz. as compared with 417 oz. in November. *Mysore.*—16,000 tons of quartz crushed produced 15,448 oz. Steamings from plates 503 oz., basebar 183 oz., and 14,000 tons of tailings cyanided yielded 1,121 oz. making a total production of 17,256 oz. as compared with 16,517 oz. in November. *Mysore West.*—Mill ran 637 hours, crushed 2,403 tons and yielded 1,061 oz. of bar gold. *Nandydroog.*—6,500 tons of quartz crushed yielded 5,446 oz. and 5,211 tons tailings cyanided yielded 508 oz., making a total production of 5,954 oz. as compared with 5,776 oz. in November. *Ooregum.*—Stuff crushed, 10,115 tons produced 4,797 oz. and slimes and tailings cyanided, 10,238 tons produced 969 oz., making a total return of 5,766 oz. as compared with 6,001 in November. *Hutti (Nizam's).*—1,130 oz. of gold from 1,750 tons of quartz crushed.

FINANCIAL NEWS

Wo Shun Steamboat Company, Limited, Hongkong.—At a recent meeting the sharehold-ders confirmed a special resolution that the capital of the company be increased to $140,000 by the creation of 900 new shares of $100 each.

Seoul-Fusan Railway Earnings.—The traffic receipts of the Seoul-Fusan Railway, since its opening for public service, are estimated to average about -Y-7 per mile per day up to the present. When the receipts amount to -Y-10 per mile per day, it is estimated that the expenses will be covered.

Hotel Metropole Company, Shanghai.—At the first general statutory meeting of this company, held in Shanghai in January, the secretary reported that business is in a flourishing condition. The extensive alterations of the hotel property which were under consideration, have been indefinitely postponed.

Hongkong and Whampoa Dock Company.—Subject to audit the directors of the Hongkong & Whampoa Dock Company, Limited, will recommend at the forthcoming meeting a dividend of 12 per cent., equaling $6 per share, and a bonus of 2 per cent., equaling $1 per share, together $7 per share, and carry forward about $500,000.

Hongkong Land Reclamation Company, Limited.—The third annual report of the Board of Directors of this company shows that in 1904 a debit balance of $6,219.10 brought forward from the previous year was wiped off, and that the year 1904 closed with a credit balance of $7,157.32. After paying directors' and auditors' fees $4,557.32 were carried forward.

China Provident Loan and Mortgage, Company, Hongkong.—The gross earnings of this company for the year 1904 amounted to $132,860, and after deducting all expenses there remainded a balance of $106,581.29, which has been appropriated as follows: To reserve fund, $25,000; to pay a dividend of 8 per cent, $80,000; placed to the credit of 1905 account, $1,581.29.

Kowloon Land and Building Company.—The sixteenth report of the Board of Directors of this company shows that the balance of profit and loss account for 1904, after writing off all charges and expenses, amounted to $18,927.79. A dividend of $3 per share was ordered paid, which, after writing off the directors' and auditors' fees, leaves a balance of $377.79 to the credit of the new profit and loss account.

Shanghai Pulp and Paper Company.—On a capital of Tls. 450,000 this company made a net profit last year of Tls. 91,271, or something over 20 per cent, against Tls. 59,709 in 1903. At the directors' meeting held in January it was decided to pay a final dividend of 8 per cent, making 14 per cent for the year, to place Tls. 15,000 to reserve, raising the fund to Tls. 25,000, to write off Tls. 8592 for depreciation, and carry forward the balance, Tls. 6,968.

Hongkong Land Investment and Agency Company.—The new profits for 1904, including $51,966.63 balance brought forward, after paying all charges, amount to $422,291.44. From this amount an interim dividend of $6 per share has been paid. After transferring $250,000 from equalization of dividend fund to profit and loss account, it is proposed to pay a final dividend of $6 per share. A balance of $37,875.70 is carried forward to credit of new profit and loss account.

West Point Building Company, Hongkong.—The General Agents submitted the following statement of the affairs of the company for the year 1904, at the ordinary meeting of shareholders on January 30th: "The net profits for the year, including the amount brought forward from the previous year, amount to $41,797.11 From this an interim dividend of $1.50 per share has already been paid, and after writing off directors' and auditors' fees, it is now proposed to pay a final dividend of $1.70 per share, making a total dividend for the twelve months of $3.20 per share, and to carry forward the balance of $1,247.11 to credit of a new profit and loss account."

China and Manila Steamship Company Limited.—The Attorney-General, Mr. E. H. Sharp, K. C., made application recently in the Original Jurisdiction of the Supreme Court at Hongkong, before the Chief Justice, His Lordship Sir Henry Berkeley, on behalf of the China and Manila Steamship Company, Limited, for reduction of the corporation's capital, in accordance with a special resolution passed at two extraordinary meetings of the company held last October, that the capital, of the company be reduced from $1,500,000, being 30,000 shares at $50 each, to $7500,000, made up of the same number of shares at $ 5 each. The amount reduced represents losses in business. The Chief Justice granted the application.

Voluntary Liquidation.—The Australian Portland Cement Company, Limited, of Fyansford, Geelong, Victoria, has gone into voluntary liquidation.

Another Rubber Company.—The Sungei Wei (Selangor) Rubber Company, Limited, has been floated in Glasgow with a capital of £50,000 in £1 shares, with a view to growing rubber, coffee, etc., in the Malay Peninsula.

Shanghai Firms Consolidate.--Messrs. Ramsay & Co., of Hankow, and Messrs. W. W. King & Son have amalgamated their interests. The new firm will be known at Shanghai, Hankow, and Colombo as King, Son & Ramsay.

Mineral Water Companies Amalgamate.—The Tientsin International Mineral Water Company, Limited, and the Tongshan Brewing and Mineral Water Company, Limited, have been amalgamated, the former taking the latter company over by the issue of new shares at par.

Peking Board of Trade and Bank.—The Chinese merchants of Peking have organized a board of trade and a bank with the cooperation of the Board of Commerce. The bank is scheduled to open some time this month. The bank notes are to be printed in Japan and a special commissioner has been sent there to see to the printing of bills to the extent of Tls. 3,000,000.

Hongkong Ice Company, Ltd.—The annual report for 1904 shows that including $5,844.57 brought forward from the previous year, and after deducting $20,000 paid as an interim dividend of $4 per share, the balance at credit of profit and loss account is $103,356.77, which is appropriated as follows: Final dividend of $13 per share, $65,000; provision for contingencies, $25,000; to write off property account, $8,000; carried forward, $5,356.77.

Grand Hotel, Limited, Yokohama.—The shareholders held their thirty-first semi-annual meeting on January 27th, at which the directors submitted their report for the half year ended December 31st, 1904. The net profit for this period, after providing for general expenses, directors' and auditors' fees, and sundry creditors, and after writing off bad or doubtful debts, amounts to -Y-12,563.33. To this is added by transfer from suspense account, -Y-12,298.61, which it is proposed to apply as follows: In payment of a dividend of -Y-6 per share for the half year, -Y-15,000; for depreciation, -Y-9,861.94. The dividend was payable January 28th.

Humphreys Estate and Finance Company, Limited.—The shareholders of this company held their nineteenth ordinary annual meeting in Hongkong on January 10th, and the directors submitted their report for the year 1904. The net profit for that period amounted to $135,757.48, to which is added balance brought forward amounting to $9,117.04. Remunerations in the sum of $13,575.74 being deducted, the amount left available for appropriation is $131,358.78. The directors recommended that a dividend of 90 cents per share on fully paid-up shares and 22½ cents on the $2.50 paid-up shares, or 9 per cent on the paid-up capital, be paid to the shareholders, absorbing $119,400.75 and that the balance of $11,958.03 be carried to new profit and loss account.

Weihaiwei Gold Mining Company, Limited.—The shareholders of this company held a meeting in Shanghai on January 11th to consider its financial position, Mr. Marcus Wolff presiding. The session was stormy and lasted for nearly two hours. The chairman announced that the company was practically insolvent, in that besides the salaries, etc., due for January, bills amounting to $6,800 had to be met and the funds on hand out of which to pay them amounted to about $5,574. The mill manager's proposition to order the mill shut down and all hands discharged immediately, was ridiculed. The directors were severely taken to task by certain gentlemen, and they were asked to resign. It was finally decided that another meeting of the shareholders should be called in the near future to reconstruct the company and elect a new board of directors.

Peking-Hankow Line.—Negotiations are reported to be in progress by the Banque de l'Indo-Chine for the issue of a new f.35,000,000 loan, the proceeds of which are wanted for continuation of the works on the Peking-Hankow railway.

Straits Dollar Curtailed.—The Governor of the Straits Settlements, with the advice of the Executive Council, and subject to the approval of the Secretary of State for the Colonies, has prohibited the exportation from the colony to any place outside the Malay Peninsula, Netherlands East Indies, and Borneo, of the coin known as the Straits dollar.

Canton-Hankow Railway.—Mr. J. Pierpont Morgan has purchased the interest in the Canton-Hankow Railroad, recently acquired by a Belgium Syndicate of which King Leopold was the chief stockholder. Due to the position of the Chinese Government, that the charter granted was special to the American Syndicate and could not be assigned to any other foreign corporation, the Belgium stockholders let go their interest to the New York financier.

Philippines Steamship Company.—The South Philippines Steamship Company is a new shipping concern that has just been organized at Zamboanga, Mindanao, with the following officers: President and General Manager, Harry Pfort; vice-President and Secretary, P. J. Moore; Treasurer, S. E. DeRackin. The directors are Messrs. Pfort, Moore, DeRackin, and Frank W. Redding, all American residents of Moroland. The company expects to have a boat running not later than April 1st, which will make three regular trips each month from Zamboanga—one to the Jolo group, one to the south coast of Mindanao, and the other yet to be determined.

PHILIPPINE TREASURY DRAFTS

The Bureau of Insular Affairs of the War Department has received a cablegram from the Governor-General of the Philippines authorizing the International Banking Corporation of Washington and the Guaranty Trust Company of New York, depositories of the Philippine funds in the United States, to sell demand drafts on the Philippine Treasury at Manila at three-eights of one per cent for demand drafts and three-fourths of one per cent for telegraphic transfers, in sums not less than $5,000, those rates being in modification of those previously authorized, which were three-fourths of one per cent and one and one-eighth per cent, respectively. The modification of these rates was made by the Secretary of Finance and Justice of the Philippines under the discretionary authority conferred upon him to increase or decrease the same as conditions might warrant.

BOOKS AND CATALOGUES RECEIVED

The Far Eastern Review takes pleasure in acknowledging the receipt of No. 14, Vol. I, of the *Journal of the American Association* of China, published in Shanghai, which reaches this office through the courtesy of the Executive Committee of that organization. This issue contains a fund of interesting matter dealing with American trade and industry in China, together with a very instructive lecture on "Manchuria," which the Hon. James W. Davidson, F.R.G.S., Acting Consul-General at Shanghai, delivered before the Association last December. The leading editorial is devoted to "Monetary Matters," and utilizes an extract from an editorial on the subject of currency with reference to the Philippines, culled from the October number of The Review.

There has reached this office since the last issue of The Far Eastern Review an illustrated catalogue of vessels built by Messrs. Riley, Hargreaves & Co., Limited, engineers, shipbuilders and general contractors of Singapore, which throws considerable light on the excellence of the work done by this firm. Steam vessel construction is illustrated as follows: Yacht *Seamew*, for the Governor of the Straits Settlements; passenger and cargo steamer *Sarie Borneo*, for Chinese owners; passenger and cargo steamer *Aing Leong*, for Chinese owners; river passenger and cargo steamer *Meranti*, for Chinese owners; touring and communication launch *Lloyd* for the Norddeutscher Lloyd Steamship Company; patrol and communication vessels *Rikat Ida*, and *Sampit*, for the Government of the Netherlands Indies; the *Idris*, one of six steam launches built for the Government of the Federated Malay States; launch *Ban Leong Watt*, for Chinese owners; touring and passenger tender *Pulau Besar*, for the service of the Straits Steamship Company, Limited; sternwheel steamer *Ogan*, for the Koningklijke Paketvaart Maatschappij; sailing schooner *Terrapin*, for Dr. Abbot, explorer and naturalist; disinfecting lighter *Hygeia*, for the Government of the Straits Settlements, and the passenger and cargo steamer *Perak*, for Chinese owners.

We are in receipt of an elegant and elaborate illustrated catalogue of the products of the factories of Compañía General de Tabacos de Filipinas done in colors. The cigars are classified according to brands and are shown separately, in bunches and in packages, all of the actual shades of tobacco and colors of the wrapping being most artistically displayed.

"Hydraulic Turbines and Governors" and "The Power of the New York Subway" are the titles of two splendidly illustrated catalogues just received from the Allis-Chalmers Company, Milwaukee. This great machinery manufacturing concern has become the sole licensee in North American territory for the manufacture and sale of the world-famous turbines, governors, and other hydraulic machinery of Escher, Wyss & Company, of Zurich, Switzerland, and it has the additional distinction of having furnished the mammoth steam and electrical plant to the underground rapid transit system of New York, known as The Subway.

This office is in receipt of handsome calendars of the current year from the B. W. Cadwallader Company and Messrs. Castle Brothers-Wolf & Sons, of this city, and the Vulcan Iron Works Company, of Toledo, Ohio.

We are in receipt of the first number of *The Steam-Shovel News*, a very interesting little paper devoted to the manufacture and uses of steam-shovels, etc., issued by The Vulcan Iron Works Company, of Toledo, Ohio.

PAHANG'S PUBLIC EXPENSES IN 1905

Nearly half the expenditure of the state during 1905 will pass through the hands of the Public Works Department.

The motor-car service will cost $16,200.

Five thousand dollars will be spent for importing labor.

The Public Works Department staff will be strengthened by the appointment of three executive engineers.

The new works and buildings will absorb $82,000, the principal items being: Water supply and new ward, Kuantan, $21,000; Rest House, Bentong, $5,000. There are no other works costing over $4,000, according to official estimates.

New roads, streets and bridges, considered the most important work in Pahang, are down for $304.200.

The Bentong-Temelong Road, which is estimated to cost $778,413 for a length of 50 miles, gets an appropriation of $104,000 and the Pahang section of the Bentong-Kuala Lumpur Road gets $50,000.

The harbor works at Kuantan secured its second appropriation of $50,000.

Thirty-five thousand dollars are set aside for the Benta Bridge.

Twenty thousand dollars goes towards a cart road trace of the country between Kuantan and the present cart road system.

SINGAPORE'S LATEST BOAT HARBOR SCHEME

At present the people of Singapore are discussing another plan for the improvement of the harbor there which greatly simplifies the scheme put forward by Messrs. Coode, Son & Matthews, plans of which appeared in a recent issue of THE FAR EASTERN REVIEW. *The Straits Times* in presenting the new plan says that with the "preemption by Government of the Tanjong Pagar dock property, the imminent peril of our being immediately burdened with the incubus of Mr. Matthews' scheme is removed." The new scheme, which this paper says is a most excellent one, has been sketched out by Messrs. Swan & Maclaran along the lines suggested by the Chamber of Commerce, and outlined in the rough by a member of that institution "well known for his intelligent interest and energy in all matters connected with the shipping of Singapore."

This plan, as shown in the accompanying illustration, provides for a boat harbor pure and simple. It, in effect, extends the river from Johnston's pier to Tanjong Pagar—about a mile—and gives it a width of 1000 feet along that distance. It incidentally provides for a reclamation about half the extent of that suggested by the plan first submitted, and, while only assuming to be a boat harbor, it interferes with no possible pier or harbor extensions of the future. A brief description of the scheme has been submitted, informally to Sir John Anderson, the Governor of the Straits Settlements, and to a few other interested officials at Singapore and in London, and *The Straits Times* "can see no reason why it should not be hailed with tumultuous joy to those who have had the temerity to even tolerate the Matthews' proposal" because it differs from the latter "in being reasonable in cost and feasible in construction." An explanatory memorandum by the gentleman who designed the rough plan accompanies the map and reads as follows:

"The design of the scheme is based:—1st, upon the views expressed by the Chamber of Commerce in connection with the intended improvement of the Singapore harbor, consisting principally of a recommendation for the construction of a boat harbor, and 2nd, upon the necessity felt for more sheltered sea-frontage for the development of the trade. The chamber, although disapproving of the scheme of Messrs. Coode, Son & Matthews, has not hitherto come forward with any other scheme, indicating the lines on which improvement could in its opinion be effected to a sufficient degree to meet the actual requirements of the trade.

A deep-sea mole scheme, large enough to include the home shipping, is generally acknowledged to be too costly and therefore out of the question.

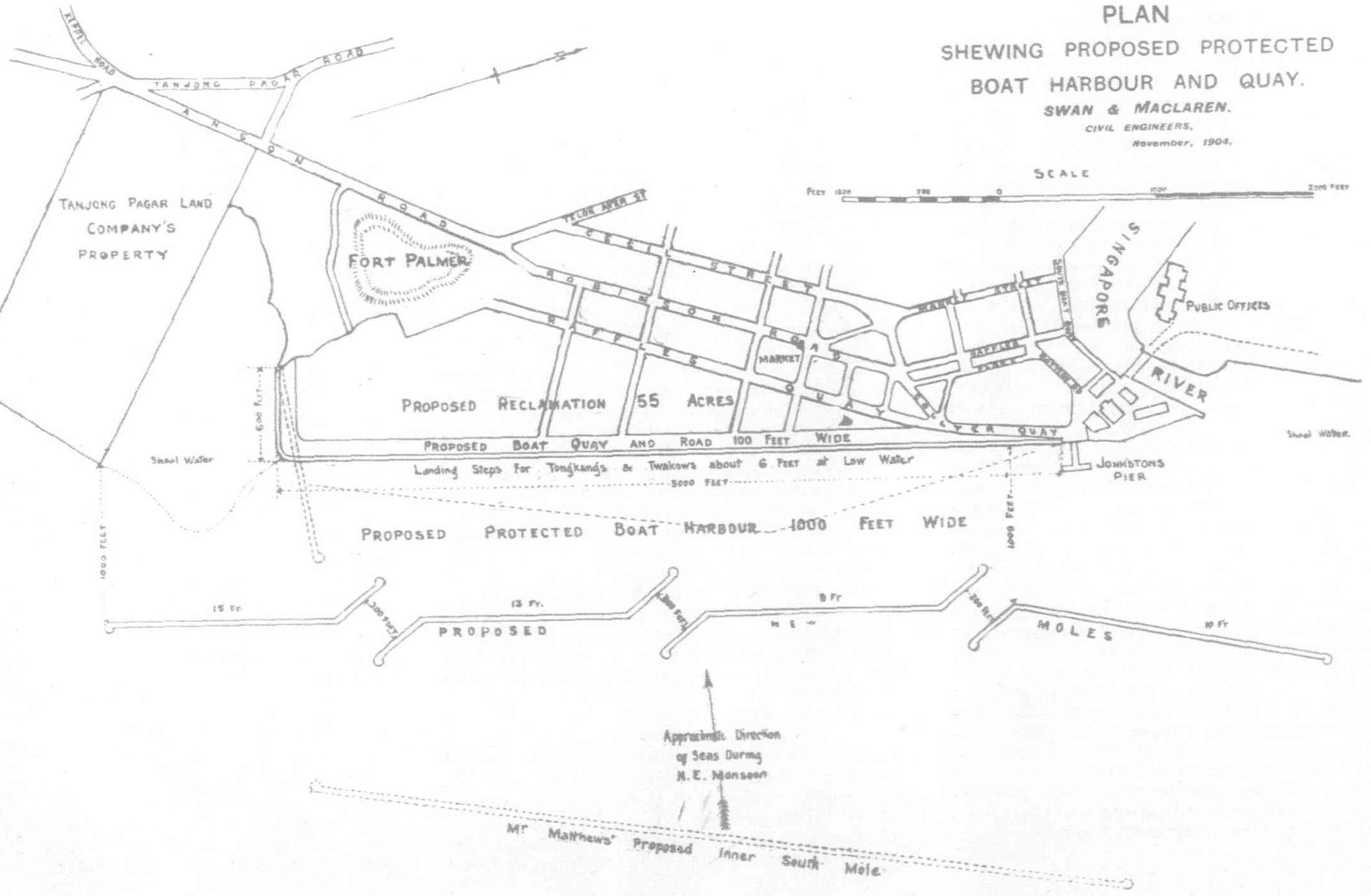
Mr. Matthews' scheme, which only provides for the local shipping, is also considered to run into too great an expenditure, the extra facilities offered not being of material advantage as compared with the existing conditions.

A smaller and less costly scheme may therefore prove itself recommendable provided that the actual and more pressing requirements are met, and provision is made for the future possible expansion of the trade of this port.

Such a scheme should provide a boat harbor for the relief of the river and for the protection of cargo boats during squalls and temporary choppy sea and swell, and at the same time protect the sea frontage of the town so as to promote the development of trade in quarters where this is at present hampered, owing to the want of facilities and shelter for the landing and shipping of goods.

The scheme now designed by Messrs. Swan & Maclaran offers all these advantages, without (judging from its more reasonable dimensions) threatening to become a financial burden to the colony.

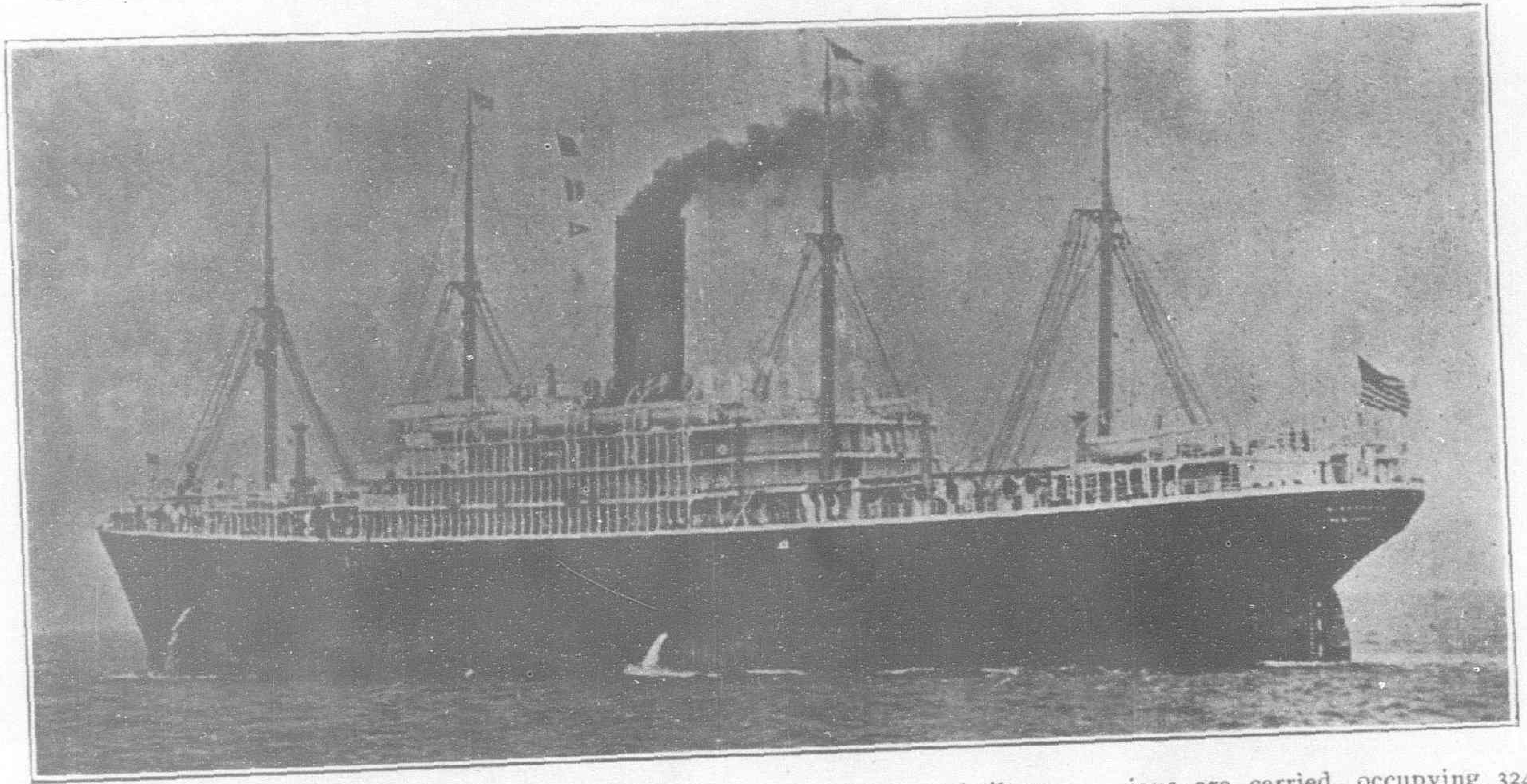
1. It provides a boat harbor, both opposite the mouth of the river and opposite Collyer and Raffles quays.
2. It provides shelter for cargo boats and protects a considerable stretch of sea frontage of that part of the town that is in the closest vicinity to the local shipping.
3. It provides a reclamation of about 55 acres at Teluk Ayer with a boat quay, widening Collyer quay sufficiently for the convenience of traffic and the handling of goods, without spoiling it and without interfering with the sea-front advantages now enjoyed by the merchants who are at present established there.
4. It provides shelter for a boat quay at Teluk Ayer and will therefore directly promote the commercial development of that district which has so far been hampered owing to its present boat quay not being protected during the N. E. monsoon.
5. It will for the above reasons directly and very considerably relieve the river, both as regards sites for the storing, landing, and shipping of general goods, rice, and produce articles, as well as regards the present congestion by cargo-boats.
6. It protects the mouth of the river as well as Johnston's pier.
7. It provides a safe passage for cargo boats between the river and Tanjong Pagar.
8. It does not interfere with the free ingress and egress of steamers, as the harbor is not enclosed.
9. It does not materially interfere with the berthage of those steamers that now anchor close in shore, and which by the inner mole suggested by Mr. Matthews would be driven away for a considerable distance from the mouth of the river and from other shipping and landing sites.
10. It does not stand in the way of any future development of the Kallang basin.
11. Its cost may be safely estimated to be within the power of the colony's financial resources, at any rate the expenditure would be fully justified as being in the general interests of the trade.
12. It is capable of extension for wharfage accommodation in the future for local and even for home steamers, should necessity therefor arise.
13. The nature of the works, consisting principally of the construction of a few shallow water moles and of a reclamation, will fall within the scope of our local contractors and will therefore be a matter for local enterprise.



SINGAPORE HARBOUR

PLAN
SHEWING PROPOSED PROTECTED
BOAT HARBOUR AND QUAY.
SWAN & MACLAREN.
CIVIL ENGINEERS,
November, 1904.

GREAT NORTHERN STEAMSHIP "MINNESOTA"



Leaving Seattle on January 21st the monster new steamship *Minnesota* is due to arrive in Manila about March 4th, via Oriental ports. She is consigned to Messrs. Smith, Bell & Co., and on her initial trip will stop at all ports along the route.

The *Minnesota* is the first of the pair of mammoth steel ships built for the Great Northern Steamship Company's trade in the Orient to be placed in commission. Her sister ship, the *Dakota*, is still under construction. These giant vessels are the largest cargo-carriers, in the world. The tremendous natural resources of the United States and the gigantic struggle among transportation companies to reach competitive markets of the Orient, the stimulation of traffic and trade by the acquisition of the Philippines, and other commercial advantages which have been developed by America's policy of trade expansion, are what made these great vessels possible. They are built under Lloyd's special survey, their passenger accommodations compare favorably with those of the best Atlantic liners, and in cargo-carrying capacity and equipment they also excel.

The new ships are 630 feet in length, 73.6 feet in beam, and 56 feet deep from the keel to saloon deck amidships. Add to this the height of the various decks and the total depth from keel to the upper navigating bridge is 88 feet 4 inches. The total deadweight capacity is 23,000 tons of 2,240 pounds, in addition to the weight of stores and equipment, while these vessels have a cubical capacity of 28,000 tons of 40 cubic feet available for the stowage of light cargo. Each vessel can carry over 2000 people, including 250 passengers, 68 intermediate, 1,500 troops or steerage, and a crew of 250 men. Novel features of the mechanical equipment are the installation of water-tube boilers—the first to be used on ocean-going mercantile steamships—having mechanical stokers and screw ash-conveyors; electric winches on deck for hoisting cargo, which are practically noiseless; both electric and steam steering gear; a system of electric heating for cabins; a perfect ventilating system forcing hot and cold air, as may be desired, through the ship, and an unusual number of appliances for safety in case of fire or accidents. The figures giving the general dimensions of these new ships convey but an imperfect idea of their great size. An ordinary cargo of either would make a hundred railway train-loads of twenty-five cars each, or a single train seven miles long. In the construction of each vessel, 12,000 tons of steel plates and shapes were used.

The *Minnesota* and the *Dakota* are the heaviest vessels ever built under Lloyd's survey. They have double bottoms 6 feet deep, built on the cellular system. The whole plan embraces a double bottom, extending the entire length of the ship, and fifty-six water-tight compartments insure safety under all conditions. Five continuous steel decks extend the entire length of the hull, with three additional in the deck houses. The vessels are divided transversely into thirteen water-tight compartments by bulkheads, insuring increased safety to passengers.

In many respects these ships have the finest equipment for passenger service of any vessels in the world. Almost every stateroom for cabin passengers is located above the weather deck as near amidships as possible. The staterooms are finished in white enamel, with mahogany, also white enamel with oak fittings. All are outside rooms. All apartments are electrically lighted and heated, and there is plenty of water, both hot and cold. There are electric reading lights and each stateroom is equipped with a spacious wardrobe and fittings. Each stateroom is so arranged that it may be used singly or en suite. Suites de luxe have been arranged on the promenade and bridge decks. These are especially handsome and well furnished. The wide promenade deck spaces are light and airy halls, and all of the passageways, corridors and hallways are covered with rubber tiling. The handsomest hall on the vessel is the bridge deck, for the wainscoting of which cherry and sycamore are used in artistic contrast.

The main dining saloon, which seats 190 persons, is on the saloon deck almost amidships, and is finished in paneled mahogany. The ceiling is in handsome stucco work of cream and gold. The ceiling and beam capping are of staff panels, electric fixtures and exhaust vents being in alternate panels. The rectangular lights at the front and sides of this saloon all hinge and are fitted with sliding blinds, sliding colored glass and hinged vent. The floor is of hard wood and carpeted. From the saloon a grand stairway of mahogany, with handsome carved baluster, leads to a roomy hall on the promenade deck. The same excellent scheme embraces the ladies' boudoir and library, the nursery or playroom for children, the smoking room and barber shop and the café.

The intermediate, or second-class passenger accommodations, are situated forward on the main deck. Each ship has an up-to-date laundry, while the ventilation system is perfect throughout. Two hospitals are a feature of the main deck.

About 66,200 cubic feet, or 1,655 tons of each vessel's space, is devoted to cold storage in hold No. 3. In hold No. 5 the ship's provisions are carried, occupying 324 tons' space of additional cold storage. The powerful plant for refrigerating the holds is located in a house on the saloon deck. Part of hold No. 3 is set aside for carrying silk, and there is also a specie or treasure room.

There are eighteen hatches on each vessel, and thirty-two winches and booms for handling cargo, some of them fitted to lift weights up to 30 and 50 tons. The special booms for lifting these heavy weights are stepped on deck, while the ordinary booms are fitted on platforms built on the masts about eight feet above the decks. The whole cargo-hoisting apparatus is operated by electric winches which, being fitted with steel wire, are practically noiseless.

In each of these giant ships steam is generated by sixteen Niclausse water-tube boilers, constructed for a pressure of 250 pounds to the square inch, with 40,614.8 square feet of heating surface, and 1,080.8 square feet of grate surface. The boilers are fitted with Duluth stokers, with ash conveyors at the back, operated by the same engines driving the stokers. This is the first installation of mechanical stokers on an ocean-going passenger and cargo vessel. The coal bunkers, with a capacity of 6,000 tons, are ample to provide the huge vessels for an 11,000-mile voyage if necessary. The steamers are propelled with twin screws, fitted with bronze blades, each having two sets of three-cylinder, vertical, triple-expansion engines of direct-acting, surface-condensing type. These engines have cylinders 29 inches, 51 inches and 89 inches in diameter, by 57 inches stroke, and are designed to develop about 5,000 h.p. each.

The electric plants of these two huge liners are the finest and largest ever placed aboard an ocean vessel. All of the auxiliary machinery and appliances outside the engine rooms—except the propellers and the main windlass and steering machinery—are electrically operated, six generators being utilized. The dynamos have a normal output of 4,000 amperes, and there is a total of 1,566 h.p. represented in the motors on each ship. Electricity is the motive power for the ventilating apparatus, the refrigerating machines, the alternate steerin gear, the warping capstans, the winches for handling cargo, and for heating and lighting. Each vessel is fitted with an electric whistle control, electric cooking apparatus, a complete telephone system, an electric operation of dumb-waiters and elevators, of alarm signals, searchlight, mastheadlights, fog whistles, telltales and indicators. The three-wire system is used, with switch-boards arranged conveniently throughout.

THE RAUB AUSTRALIAN GOLD MINES

(Continued from page 29.)

Amalgam produced	oz.	28,579	—
" " boxes		15.2	33.9
" " wells		23.8	27.7
" " plates		46.8	28.9
" " pans		14.2	9.8
Sponge Bullion produced from Amalgam	oz.	9,287,5	—
" " in proportion to Amalgam—boxes	o[o	40.13	41.80
" " " wells	"	34.05	39.00
" " " plates	"	31.03	30.50
" " " pans	"	35.08	43 01
" " " total	"	32.80	38 70
Melted Bullion produced from " sponge	oz.	9,140.10	11,156.79
" " in proportion to sponge — boxes	o[o	98.17	—
" " " wells	"	98.87	—
" " " plates	"	98.25	—
" " " pans	"	98.70	—
" " " general	"	—	—
" " " average	"	98.39	97.00
" in proportion to Amalgam—general average	"	32.38	36.60
Finesess of Bullion, general average		920.67	914.10
		S. D.	
Value per oz. at Mint rates	Stg.	78[2-26	—
Value per oz. at Mint rates	Mex.	$43.43	—

solve the problem of cyaniding the whole of the effluent from the battery plates without any intermediate stage of concentration, and evidence was given justifying such an effort.

At that date, there existed in this office the following report on Raub tailings from the Borneo Co , Ltd., Bau, Sarawak, where cyanidation has been brought to an extremely successful point:—

"The sample received from the Raub Company assays 2½ dwt. gold per ton. Treated with .05% K Cy. solution, only a trace of gold was extracted; .1% .2%, and .25% K Cy. solutions, with the addition of both lime and soda, gave an extraction of only ½ dwt. Moreover, it would be necessary to remove 30 to 40% of slimes from these tailings before a leachable product could be obtained. In view of these facts, *these tailings do not appear to be amenable to cyanide treatment.*"

This seemed such a final and complete pronouncement that it was thought advisable to still carry on some experiments on the treatment of concentrates only (which I had already condemned in principle), trying all the various modifications as used in W. Australia and elsewhere, and even some modifications of our own; but the failure of all these was almost assured in practice by the enormous amount of mercury contained in the concentrates.

Careful search was then made in the tailings for the possible presence of any obscure mineral which might prove an obstacle on chemical grounds. None could be found.

That source of trouble being eliminated, we set out to try simple leaching of our "sands." It must be explained here that a mixed mass of tailings, or the effluent of a mill, will consist of two portions—a coarse material, which is known as sands, and fine, called "slimes." Owing to the easy manipulation of sands, they are the desideratum of all cyanide operators. Slimes usually involve endless difficulties both in the application of the cyanide liquor and in the removal of the gold liquor. Our ordinary mill product consists of about equal volumes of sands and slimes.

Ignoring the slimes for the moment, we proceeded to treat the sands, using in turn every strength of solution from .05% to 1% K. Cy, and continuing the treatment for 7 days, with decantation, aeration, addition of Br Cy, and every modification that suggested itself, with a result that even with a cyanide consumption of 2½ to 7lb per ton of tailings assaying 3¼ dwt. we only got 20 to 40% extraction. Such figures, of course, placed that treatment out of the question.

The most obvious explanation of our failure was a simple mechanical one, viz., that the rocky grains containing the gold were too coarse to allow of the cyanide solution reaching and dissolving out the metal. To prove this, we ground a portion of the same sands till they would pass an 80-mesh sieve and then applied a similar solution. In 48 hours, with a consumption of 4¾lb K Cy, we extracted 75% of the original 2¼ dwt.

This marked the beginning of our success. Proceeding from bottle tests to parcels of a cwt. or so in a barrel, and then to working lots of a ton or more in one of the old tanks, with a centrifugal pump fitted as an agitator, we finally arrived at an extraction of 70% of 1¾ dwt. in about 5 hours' treatment, with a consumption of less than ½lb K Cy per ton. This leads me to feel justified in counting upon 75% on 2 dwt. tailings at a cost of less than $1.00 per ton. We do not anticipate, moreover, any serious trouble in separating the liquors.

But an absolutely essential condition is that everything be reduced to slimes—exactly the opposite conclusion arrived at by the Borneo Co., who would "remove the 30 or 40% of slimes" as a preliminary to any treatment. The reduction to slimes involves providing machinery for the purpose, because the pulp cannot be retained in the mill till that condition is arrived at. Moreover, one of our objects is to treat the payable portions of our old tailings heaps, which consist exclusively of sands, the slimes having long ago been washed away, and for them, in any event, a grinding machine would be needed.

Estimates were obtained in Europe for steel

ELECTRIC POWER GENERATING STATION AT THE RAUB GOLD MINES ON THE SEMPAM RIVER, PAHANG, SHOWING PIPE LINE, BUILDING CONTAINING TURBINES AND ALTERNATORS, AND DWELLINGS OF ENGINEER AND OTHERS. AT PRESENT 450 HORSE-POWER ONLY IS GENERATED (AT 5000 VOLTS), AND TRANSMITTED ABOUT 9 MILES TO THE MINES, WHERE IT IS USED (AT 220 VOLTS) FOR DRIVING BATTERY, MINE HOISTS, MINE PUMPS, MACHINE TOOLS, ETC. A NEW UNIT OF 300 HORSE-POWER IS BEING INSTALLED, AND POWER WILL SOON BE TAKEN BY THE TIN-MINING COMPANY IN THE NEIGHBORHOOD. THIS WILL INAUGURATE A NEW ERA IN MALAYAN TIN-MINING, WHERE HITHERTO CHINESE MUSCLE HAS BEEN RELIED UPON FOR EVERYTHING AND THE WHITE MAN'S BRAIN HAS SLEPT.

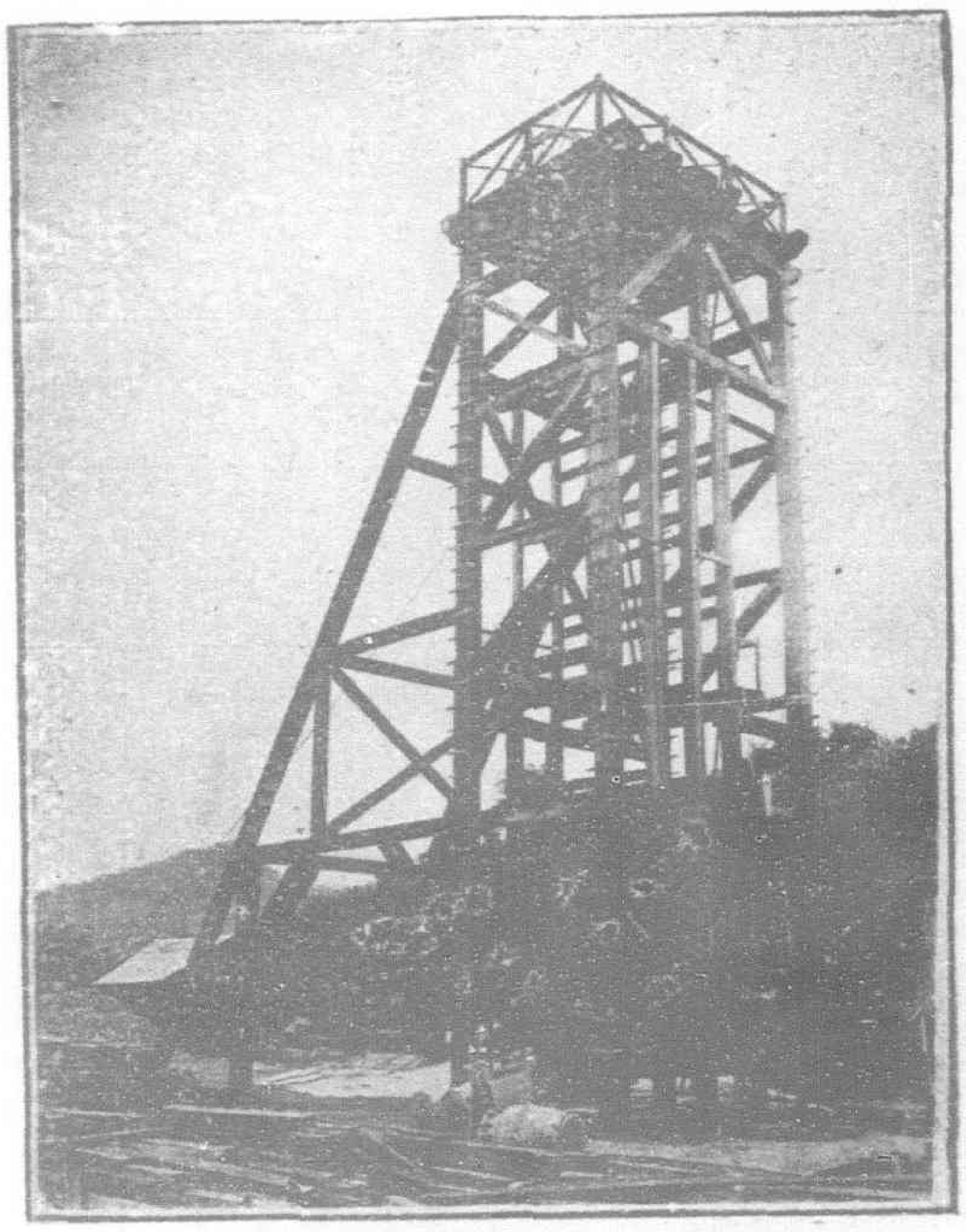
Amalgamation product per ton	dwt.	5.281	5.80
Amalgamation product per ton	o[o	74 25	72.83
Mercury loss per ton milled	oz.	.520	.538
per oz. Bullion	oz.	1.81	2.15
Tailing values per ton	dwt.	1,679	1.489
in proportion of contents	o[o	23.56	20.52

TABLE OF MILLING COSTS.
Costs per ton, stated in cents.

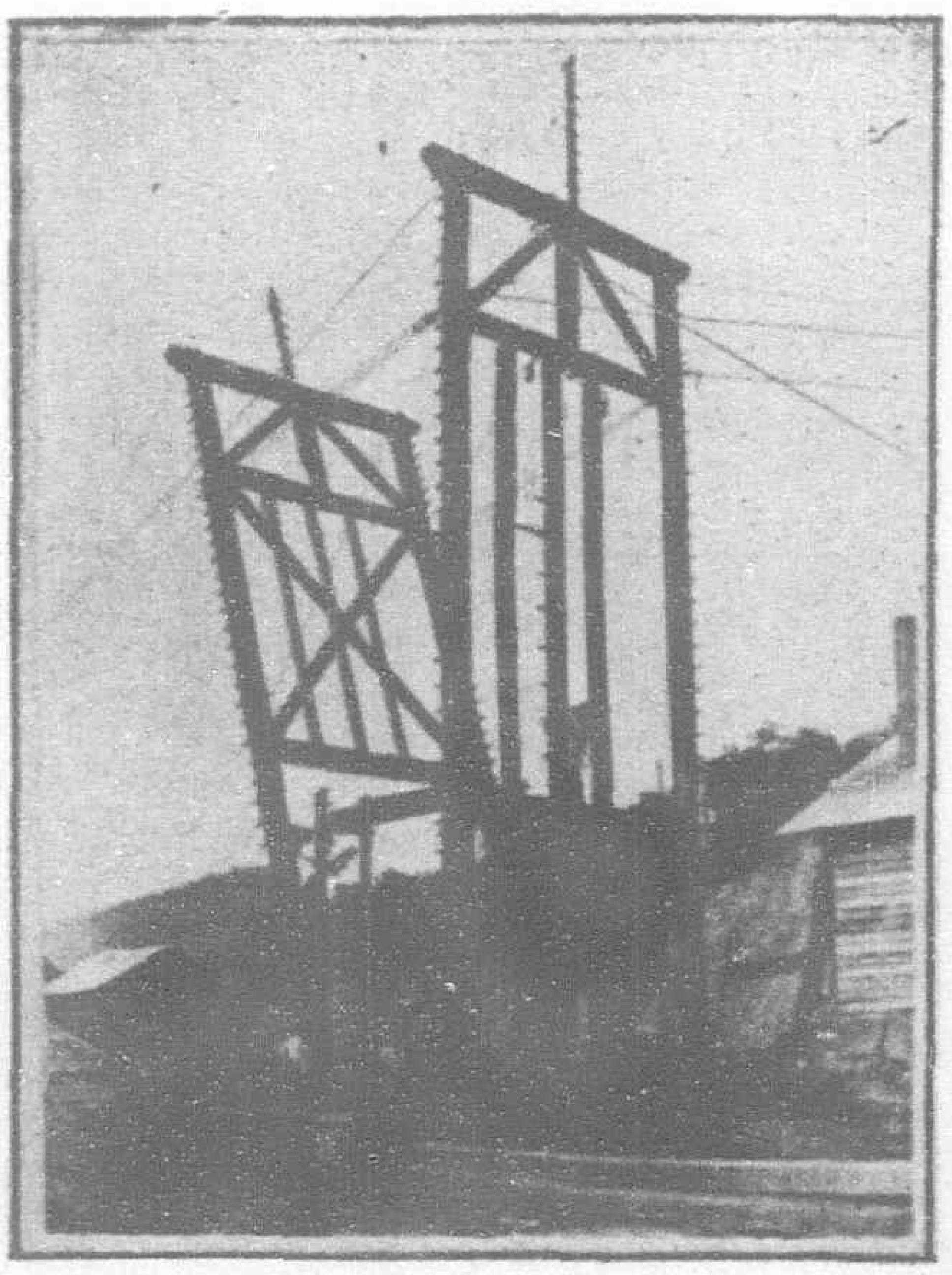
	1903.	1902
Power (90 per cent of total cost of Power Station and transmission)	55 29	54.01
Management (including ½ Assayer's and ⅓ Chief Engineer's salaries)	22.96	25.30
Labor—Breakers	6.48	6.28
Battery	15.48	11.18
Concentration	2.28	7.69
Assay Office	0.77	2.06
Maintenance and Stores	10.29	7.51
Grand Totals	$113.55	$114.03

Such figures leave the mills of the Homestate Co. (America) and the Rand far in the shade, and they are rivalled only by those of the great Alaskan batteries which are run on much softer ore. Moreover, the whole of those mills base their calculations on the "short" ton, which is 12% less than ours.

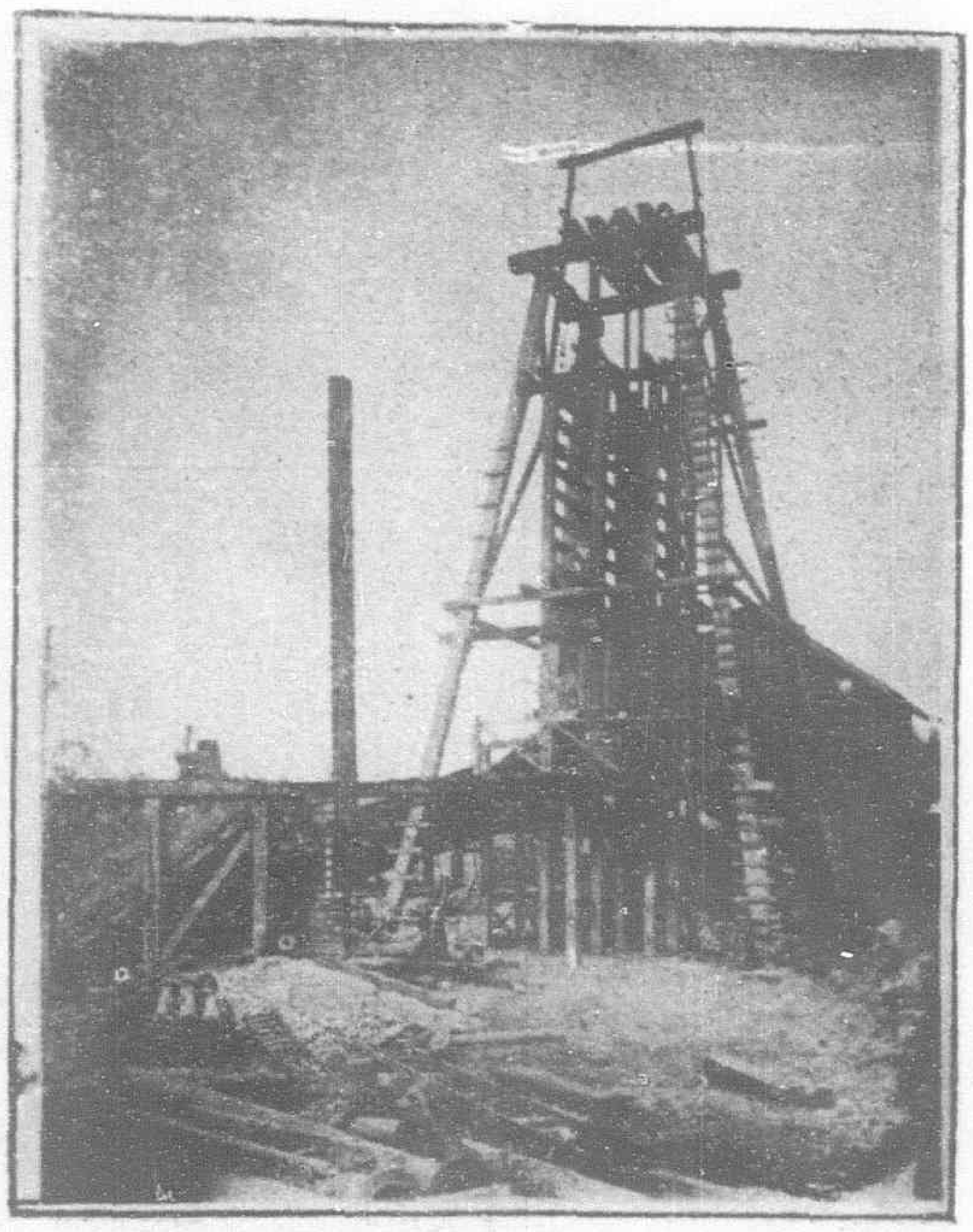
Cyanidation.—It was foreshadowed in the 1902 report that an effort would be made to



THE HEADGEAR COMPLETE.



NEW MAIN SHAFT—ERECTING SECOND PAIR OF LEGS.



OLD MAIN SHAFT, AND ORE BINS ALONGSIDE RAILWAY TO BATTERY.

plates for making the necessary tanks of various kinds, but the cost seemed extravagant, besides necessitating a vast amount of riveting on the spot. We have, therefore, adopted wooden vats, which can be cut and made on the property. The planks for making these are to a large extent already sawn, the ground surface has been in part prepared, and a substantial shed has been erected. While the grinding machinery is on its way, the work will be proceeded with.

The contents of the tailings pits, both at the old Raub mill and at Koman, have been measured, sampled, and assayed. They show that at Raub there are some 2,600 tons, averaging 4 dwt., and at Koman about 7,450 tons with a mean value of 3½ dwt.

The aggregate gold contents of the two pits is about 1,820 oz. fine metal, worth say $45 per oz. or over $80,000. Allowing for 75% recovery, and about $1 a ton for treatment, they should give a net gain of about $50,000.

Returns.—The total output of gold bullion for the past year has been 9,140.1 oz., equivalent to 5.281, dwt. per ton. This brings the grand total recorded production to 118,242 oz., and makes the mean return per ton raised and milled equal to 10.86 dwt. These figures take no account of unrealised values lying in blanket and buddle concentrates, and in tailings at Raub and Koman, which aggregate a very substantial asset that we hope soon to draw upon.

Working Costs.—The figures for 1902 introduced into the accompanying table of working costs for comparison relate, of course, only to the last three months of that year. There is a healthy falling off in surface wages, which we look to still further decrease as steam goes out of use. The increase in timber and fuel occurred all in the last two months of the year, when the excessive rains upset all our plans; this will be a rapidly diminishing item when our electrical plant comes into service.

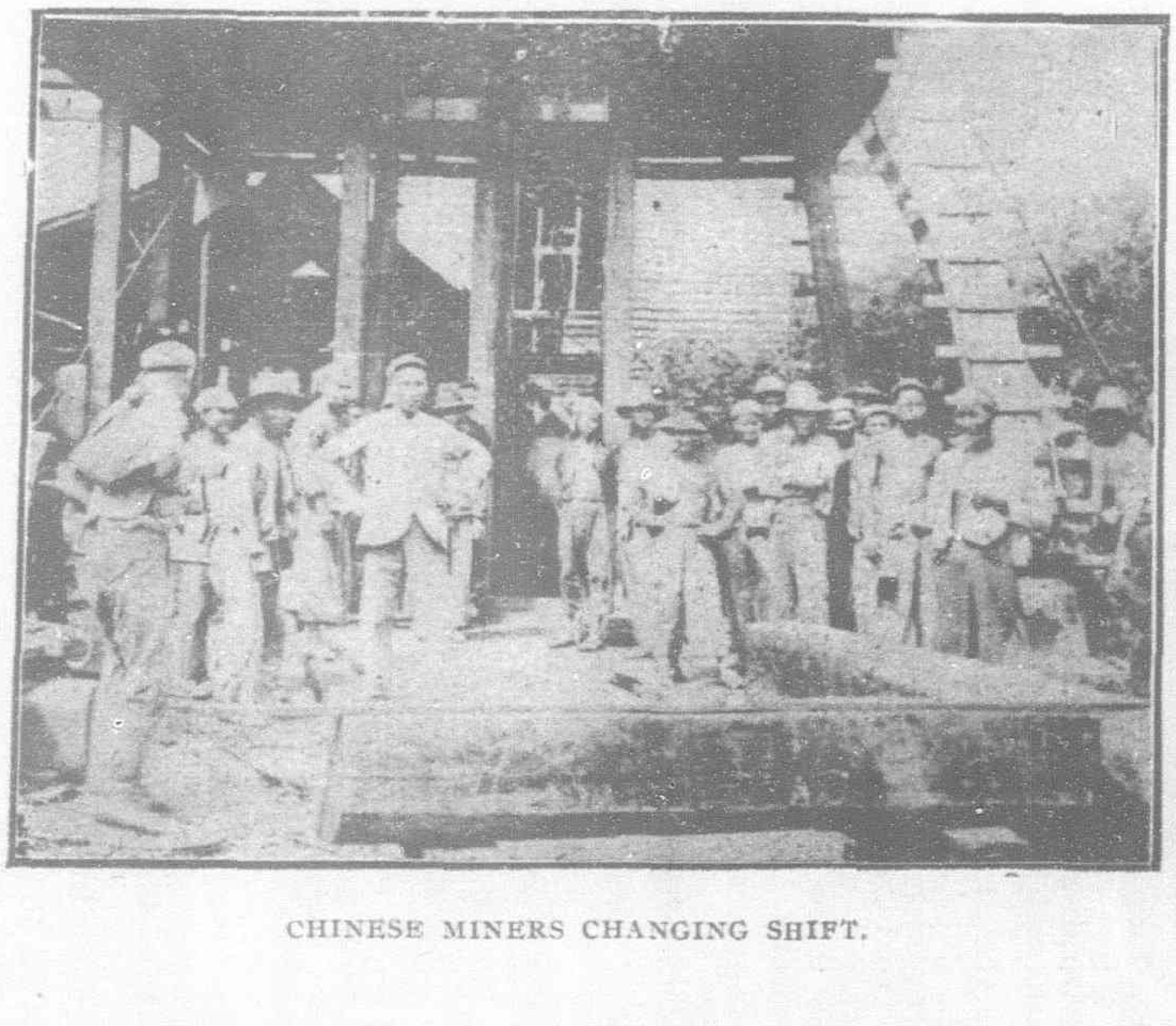
TABLE OF TOTAL WORKING COSTS

	Total	1903. Monthly Average.	1902. Monthly Average.
European salaries	$62,140.96	$4,780.07	$5 996.40
Surface wages	54,127.95	4,163 67	5,422.24
Development wages	24,060.48	1,850.83	4,544.00
Ore raising wages	56,412.01	4,339.39	4,389.28
Timber, fuel, and charcoal	24,329.48	1,871.50	1,368.48
Stores	23,859 28	1,835.33	2,131.04
Petties	2,766.14	212.77	155 52
Royalty on gold export duty	17,300.00	1,330.77	20,44.81
Grand total and average.	264 996.30	20,384.33	26,051.7
Average cost per ton	$7.63		$7.94
do.	dwt. 3.45		dwt. 3.33
Total expenditure on working account	264,996.30		
Total expenditure on capital account*	47,015.66		
Grand total expenditure for the year	312,011.96		
Estimated net value of bullion produced	$393,000		

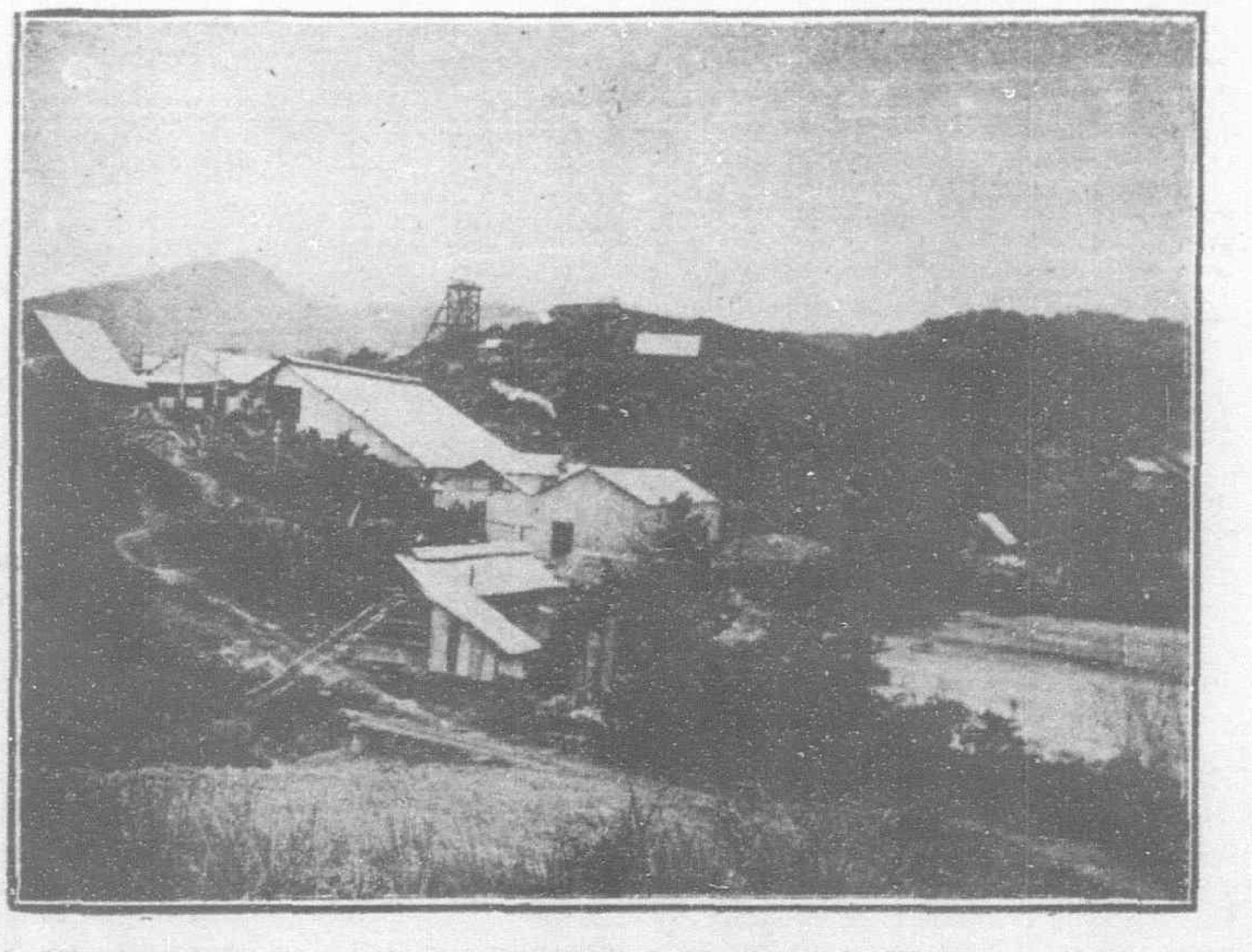
* Of this sum, $28,605.42 is on account of the New Main Shaft, one half being chargeable to the Government.

Royalty or Gold Export Duty, as it is variously called, has aggregated no less than $17,300 for the year, a sum almost equivalent to that expended on mine development, and amounting to 8% of our total working cost, or about half a dollar ton! Happily this has been reduced to more reasonable proportions.

The net result, then, of the year's operations has been that, keeping our working costs below 3½ dwt. per ton, and with a product of only 5¼ dwt., we have paid for *everything*, both on working account and on capital account—not even excepting the double share of the New Main Shaft outlay—and have put by about $80,000 in addition.—C. G. WARNFORD LOCK, F. G. S., M. I. M. M., General Manager.



CHINESE MINERS CHANGING SHIFT.



A GENERAL VIEW OF THE RAUB SEMPAM MINES SHOWING THE OLD MAIN SHAFT (RIGHT BACKGROUND), NEW MAIN SHAFT AND MANAGER'S RESIDENCE (HILLTOP BACKGROUND), AND THE 40-STAMP BATTERY OFFICE, LABORATORY, AND TAILINGS PIT.

FAR EASTERN STOCKS AND QUOTATIONS

COURTESY OF BENJAMIN, KELLY & POTTS, SHAREBROKERS, HONGKONG-MANILA, 10th February, 1905.

STOCKS	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
											PER CENT	
Banks.												
Hongkong and Shanghai Banking Corporation	1865	$10,000,000	80,000	$125	$125	g £1,000,000 s $7,000,000 i $250,000	$1,492,554	30-6-04	£1.10s. @ exchange 1s. 9 15-16 =$16.41 for first half-year 1904	22-8-04	5	$720 buyers London £75
National Bank of China, Limited	1891	£699,475	99,925	£7	£7	$175,533 c $191,973	$21,668	31-12-03	$2 (London 3s. 6) for 1903	1-2-04	5¼	$38 sales
Marine Insurances.												
Canton Insurance Office, Limited	1881	$2,500,000	10,000	$250	$50	$1,400,000 j $81,739	$150,494	31-12-03	$17 for 1903	22-10-04	6¾	$260
China Traders' Insurance Co., Ld.	1865	$2,000,000	24,000	$83.33	$25	$950,000 f $151,992 j $362,366 u $371,445	Nil.	30-4-04	$4½ for year ended 30-4-1904	8-12-04	7½	$58½ sales
North China Insurance Co., Ld.	1863	£150,000	10,000	£15	£5	T800,000	T217,119	30-6-04	Final of 10s. making £1 for 1903	26-10-04	8	T95 sellers
Union Insurance Society of Canton, Limited	1867	$2,500,000	10,000	$250	$100	s $1,850,000 g £20,000 f $372,749 j $893,110 u $846,773	$2,078,997	30-6-04	$35 for 1903	21-10-04	5	$700 sellers
Yangtsze Insurance Association, Ld.	1862	$800,000	8,000	$100	$60	$700,000 f $37,794	$432,475	31-12-03	$12 for 1902	22-4-04	8	$160
Fire Insurances.												
China Fire Insurance Co., Ld.	1870	$2,000,000	20,000	$100	$20	$1,000,000 x $125,675 f $2,561	$329,047	31-12-03	$6 dividend and $1 bonus for 1902	11-3-04	7¾	$93 buyers
Hongkong Fire Insurance Co., Ld.	1868	$2,000,000	8,000	$250	$50	$1,170,288	$371,110	31-12-03	$22½ for 1902	7-3-04	6¾	$340 buyers
Shipping, Tug and Cargo Boats.												
China and Manila Steamship Co., Ld.	1882	$750,000	(1) 30,000	$25	$25	none	*Dr.* $63,123	31-12-03	$5 for 1900	25-3-01	—	$23
Douglas Steamship Co., Ld.	1883	$1,000,000	20,000	$50	$50	$185,000 i $85,439	Nil.	30-6-04	$2 for year ended 30-6-1904	29-9-04	6	$33½ buyers
Hongkong, Canton and Macao Steamboat Company, Ld.	1865	$1,200,000	80,000	$15	$15	e $250,000 d $600,000 f $157,555	$16,362	30-6-04	$1½ for first half year 1904	17-8-04	10¼	$26 buyers
Indo-China Steam Navigation Company, Ld.	1882	£1,200,000	(2) 60,000	£10	£10	£100,000 i £205,000	£5,853	31-12-03	10s. @ 1s. 10 5-16=$5.37.82 for 1903	13-7-04	4½	$125
Shanghai Tug and Lighter Co., Ld. Do. do. Preference	1903	T1,500,000	200,000 100,000	T50	T50	none	T55,541	31-12-03	Interim of T2 for 1904	13-8-04	9 7¼	T50 sales T48 sales
"Shell" Transport & Trading Co., Ld.	1898	£2,000,000	2,000,000	£1	£1	£400,000	£19,555	31-12-02	Interim of 1s. (Coupon No. 5) for '04	1-1-05	4	22s. sales
"Star" Ferry Co., Ld.	1898 1900	$200,000	10,000 10,000	$10 $10	$10 $5	$60,000 i $15,093	$1,287	30-4-04	$1 80, Div. 40 cts. bonus for year ending 30-4-04. $0.90, " 20 " "	2-6-04	5½ 3½	$38 $29
Straits Steamship Co., Ld.	1890	$500,000	(3) 5,000	$100	$100	$400,000 e $21,075 r $18,000 i $130,153	$33,648	30-12-03	$5 for 2nd ½ year, making $13 for '03	21-4-04	9	$140 sellers
Taku Tug and Lighter Co., Ld.	—	T. T1,500,000	30,000	T. T50	T. T50	T98,000 d T201,614	T865	31-12-03	Interim of T1½ for 1904	20-7-04	10	T30 sellers
Refineries												
China Sugar Refining Company, Ld.	1878	$2,000,000	20,000	$100	$100	none	*Dr.* $147,717	31-12-03	Interim of $5 for 1904	29-8-04	—	$227
Luzon Sugar Refining Company, Ld.	1882	$700,000	7,000	$100	$100	none	*Dr.* $73,905	31-12-03	$3 for 1897	24-3-98	—	$22½ buyers
Perak Sugar Cultivation Co., Ld.	—	T350,000	7,000	T50	T50	T100,000	T1,635	30-9-04	T2½ for year ending 30-9-04	17-12-04	4¼	T54 sellers
Mining.												
Chinese Engin'ring and Mining Co., Ld.	1901	£1,000,000	1,000,000	£1	£1	q £40,000	£7,820	29-2-04	No. 3 of 1s 6d	15-9-04	—	T7.50
Oriental Consolidated Mining Co., Ld.	1901	G.$5,000,000	z 500,000	G. $10	G. $10	none	G. $672,093	31-12-03	Final of 50 cents making G $1 for '04	30-12-04	6¼	G. $18½ sales
Raub Australian Gold Mining Co., Ld.	1892	£200,000	150,000 50,000	£1 £1	18/10 £1	£4,873	*Dr.* £4,029	31-3-04	No. 12 of 1s.=48 cents	28-1-01	—	$3¼ sales
Société Francaise des Charbonnages du Tonkin	1888	F.4,000,000	16,000	F.250	F.250	l F.307,740 a F.1,529,652	F.87,333	31-12-03	Final of F.25, making F. 50 for 1903.	1-9-04	—	$490

STOCKS	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
											PER CENT	
Docks, Wharves and Godowns.												
Geo. Fenwick and Co., Ld.	1889	$150,000	6,000	$25	$25	$70,000	$10,517	31-12-03	$3.75 for 1903	11-3-04	8	$45 sellers
Hongkong and Kowloon Wharf and Godown Co., Ld.	1886 1905	$1,500,000 $500,000	30,000 10,000	$50	$50	q $50,989 $250 000	$28,015	31-12-03	Interim of $2½ for '04 First year	31-8-04 —	4½ —	$104½ 101
Hongkong & Whampoa Dock Co., Ld.	1901	$2,500,000	50,000	$50	$50	i $25,500	$505,471	30-6-04	$6 div. & $2 bonus for 1st ½ year '04	23-8 04	7¼	$210 buyers
Howarth Erskine, Ld.	1901	$1,200,000	12,000	$100	$100	$60,000	—	30-6-04	$10 div & $5 bonus for the year	8-04	7½	$205 buyers
New Amoy Dock Co., Ld.	1892	$40,500	6,000	$6¾	$6¾	$55,500	$489	31-12-03	$1¼ for '03	5-5-04	5	$25 sellers
Riley Hargreaves & Co., Ld. Do. (Preference)	1899	$875,000	6,000 2,750	$100	$100	$150,000	$40,936	31-12-03	$10 div. and $2½ bonus for '03 $7 dividend for '03	7-3-04	6½ 6¼	$192½ $111½
S. C. Farnham, Boyd & Co., Ld.	1901	T5,520,000	55,200	T100	T100	T900,000	T48,153	30-4-04	Interim of T5 account '04-05	6-1-05	8	T152 buyers
Shanghai and Hongkew Wharf Co.	1902	T3,200,000	32,000	T100	T100	b T487,210 r T50,913	T22,895	31-12-03	Interim of T4 for '04	23-8-04	8¾	T137½ buyers
Tanjong Pagar Dock Co., Ld.	1864	$3,700,000	37,000	$100	$100	$2,100,000	—	30-6-04	$6 for first half year '04	9-04	3½	$375 sales
Yangtsze Wharf and Godown Co., Ld.	1902	T250,000	2,500	T100	T100	r T6,000	T1,760	31-12-03	T18 for '03	31-3-04	9½	T190
Lands, Hotels and Buildings.												
Astor House Hotel Co., Ld. Shanghai)	1901	$750,000	(4) 30,000	$25	$25	none	$9,989	30-6-04	$2½ for year ending 30-6-04	30-8-04	9	$27 sales
Astor House Hotel, Ld. (Tientsin)	—	T. T100,000	2,000	T. T50	T. T50	T41,000	T655	29-2-04	Interim of T4	29-10-04	6	T150 sellers
China Land and Finance Co., Ld.	1903	T300,000	6,000	T50	T50	—	—	First year	Interim of T2	1-10-03	—	T55
Hongkong Hotel Co., Ld.	1866	$600,000	12,000	$50	$50	$100,000 r $11,824 m $20,000	$11,668	30-6-04	$5 for first half-year '04	29-8-04	8	$141 buyers
Hongkong Land Investment and Agency Co., Ld.	1889	$5,000,000	50,000	$100	$100	e $250,000	$37,875	31-12-04	Final of $6 making $12 for '04	31-1-05	9	$134 sales
Hotel des Colonies Co., Ld. (Shanghai)	1902	T225,000	9,000	T25	T25	n T13,986	T680	31-3-04	T0.87½ for the year ending 31-3-04.	28-5-04	4½	T19½ sales
Humphreys' Estate & Finance Co., Ld.	1887	$1,500,000	150,000	$10	$10	i $200,607 e $50,000	$9,177	31-12-03	90 cents for '03	11-2-04	7	$12.10 ex div.
Kowloon Land and Building Co., Ld.	1889	$300,000	6,000	$50	$30	none	$377	31-12-04	$3 for '04	31-1-05	8½	$37 buyers
Shanghai Land Investment Co., Ld.	1901	T2,600,000	52,000	T50	T50	T800,000 e T150,800 x T17,114	T37,634	31-12-03	Interim of T3 for '04	18-7-04	7	T116 buyers
Tientsin Hotel des Colonies, Ld.	1903	T70,000	1,400	T50	T50	none	*Dr.* T2,123	30-4-04	Interim of T3½	23-9-03	—	T44 buyers
Tientsin Land Investment Co., Ld.	1902	T772,600	7,726	T100	T100	i T54,626	T325	31-12-03	Interim of T3 for 1904	25-7-04	7	T125 sales
Wei-hai-wei Land and Building Co., Ld.	1899	T91,850	3,764	T25	T25	none	*Dr.* T5,150	31-12-03	None	—	—	T12 buyers
West Point Building Co., Ld.	1889	$625,000	12,500	$50	$50	none	$1,247	31-12-04	Final of $1.70 making $3.20 for '04	31-1-05	5½	$57
Cotton Mills.												
Ewo Cotton Spinning and Weaving Co., Ld.	1895	T750,000	15,000	T50	T50	none	T11,655	31-10-03	T4 for year ended 31-10-03	22-12-03	17½	T23 sales
Hongkong Cotton Spinning, Weaving and Dyeing Co., Ld.	1901	$1,250,000	125,000	$10	$10	none	$22,862	31-7-04	50 cents for year ended 31-7-04	12-9-04	3¾	$13 sellers
International Cotton Manufacturing Co., Ld	1895	T750,000	(5) 10,000	T75	T75	T50,000	T13,629	30-9-04	Interim of 3 per cent account 1898	30-4-98	—	T24 sales
Laou-kung-mow Cotton Spinning & Weaving Co., Ld.	1895	T800,000	(6) 8,000	T100	T100	none	T15,500	31-12-03	Interim of 4% a/c 1898 on 6,000 shares	1-8-98	—	T32½ sellers
Soy Chee Cotton Spinning Co., Ld.	1895	T1,000,000	2,000	T500	T500	l T5,658	T26,389	31-12-03	4% for 1897	2-2-98	—	T150
Cigar and Tobacco Cos.												
Alhambra, Limited	1898	$60,000	300	$200	$200	none	$799	30-6-04	$125 for year ending 30-6-1900	15-8-01	—	$100 buyers
Philippine Company, Limited	1904	$675,000	67,500	$10	$10	—	—	—	First year	—	—	$9½
Shanghai-Sumatra Tobacco Co., Ld.	1902	T600,000	(7) 30,000	T20	T20	T24,820 v T25,000	T1,091	31-10-03	Interim of T3 per share	31-8-04	9	T67 buyers
Miscellaneous.												
A. S. Watson & Co., Ld.	1886	$900,000	90,000	$10	$10	$250,000 e $25,000	$2,883	31-12-03	Interim of 50 cents for '04	25-11-04	8	$12½ sales
Bell's Asbestos Eastern Agency, Ld.	1895	£5,377 10s	8,604	12s. 6	12s. 6	none	£161	31-12-03	6d. per share for '03	21-7 04	5¾	$5½
Campbell, Moore & Co., Ld.	1886	$12,000	1,200	$10	$10	$3,500	$596	31-12-03	$3 for 1903	2-4-04	7½	$40 sellers
Central Stores, Ld. Do. (Founders')	—	$91,845	6,000 123	$15	$12	$20,000	$1,253	31-12-03	Interim of $1.20 for '04 None	20-7-04 —	11¾ —	$21 $100
Do. (New Issue)	1904	$360,000	24,000	$15	$7½	—	First	year	Preferential of 7% for '04	20-7-04	8½	$6½ sellers
China-Borneo Co., Ld.	1903	$720,000	(8) 60,000	$12	$12	none	Nil.	31-12-03	60 cents for 1903	21-3-04	4¾	$15
China Flour Mill Co., Ld.	—	T200,000	4,000	T50	T50	T25,000	T1,942	31-12-03	T6 for 1903	23-3-04	8	T74 sales
China Light and Power Co., Ld.	1901	$300,000	30,000	$10	$10	none	$3,739	29-2-04	None	—	—	$10
China Provident Loan and Mortgage Co., Ld.	1898	p $1,000,000	100,000	$10	$10	$80,000	$1,581	31-12-04	80 cents for 1904	18-1-05	8½	$8¾ sellers
Dairy Farm Company, Ld.	1896	$187,500	25,000	$7½	$6	—	—	31-7-04	$1¼ for year ending 31-7-03	20-11-03	—	$12 buyers

STOCKS	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation* PER CENT	CLOSING QUOTATIONS
Miscellaneous.—Continued												
E. L. Mondon, Ld.	1902	T350,000	7,000	T50	T50	none	*Dr.* T152,318	31-12-03	T5 for 1902	2-5-03	—	T10 buyers
Fraser & Neave, Ld.	1898	$225 000	4,500	$50	$50	$169.116	$2,706	31-12-03	$5 dividend and $2½ bonus for '03	26-3-04	7½	$100
Green Island Cement Co., Ld	1889	$1,000,000	100,000	$10	$10	$350,000	$32,115	31-12-03	$1½ for 1903	7-4-04	5	$28½ buyers
Hall & Holtz, Ld.	—	$420,000	(9) 21,000	$20	$20	$186,000	$13,104	29-2-04	Interim of $1	28-11-04	14	$22 sales
Hongkong and China Gas Co., Ld.	1864	£70,000	7,000	£10	£10	*f* £23,109 £3,000	£7,625	31-12-03	Final of 6 per cent and bonus of 1 per cent making 22s. for '03	25-5-04	7½	$160 buyers
Hongkong Electric Co., Ld.	1889 1899	$600,000	30,000 30,000	$10 $10	$10 $5	none	$1,747	30-4-04	$1 00 50 cents } for year ending 30-4-04	18-7-04	6¾ 5½	$15 buyers $9½ sales
Hongkong High-Level Tramways Co., Ld.	1887	$125,000	1,250	$100	$100	$50,000	$2,796	30-11-04	$15 for year ending 30-11-04	24-12-04	5¾	$265
Hongkong Ice Company, Ld.	1881	$125,000	5,000	$25	$25	*k* $35,000	$5.844	31-12-03	Interim of $4 for 1904	2-8-04	6	$255 buyers
H'kong Rope Manufacturing Co., Ld.	1883	$500,000	10,000	$50	$50	$50,000	$8,395	31-12-03	$10 for 1903	8-2-04	6½	$155
Hongkong Steam Waterboat Co., Ld.	1900	$150,000	15,000	$10	$10	$2,500	$299	30-9-04	Final of 70 cents and 50 cents bonus, making $1.90 for the year	26-11-04	9½	$20
Katz Brothers, Ld.	1896	$1.000,000	10,000	$100	$100	$375,000	—	31-12-03	$13 for 1903	...-3-04	9¾	$135 buyers
Lane, Crawford & Co., Ld. (Shanghai).	1903	$250,000	2,500	$100	$100	none	$21,582	29-2-04	Interim of $5	19-11-04	8½	$140 buyers
Maatschappij tot Mijn-, Bosch- en Landbouwexploitatie in Langkat	1902	G.2,500,000	25,000	G.100	G.100	*i* T334,669 T11,143	T27,187	31-10-03	Fourth quarterly dividend of T5 making in all T35 for 04	15-12-04	13	T277½ sales
Maynard & Co., Ld	1901	$34,000	3,400	$10	$10	none	$803	31-12-03	$2 for year ended 31-10-03	...-1-04	7¼	$27 buyers
S. Moutrie & Company, Limited	1899	$200 000	4,000	$50	$50	$5,000	$832	30-6-04	Final of $3 making $5 for year end. 30 6-04	28-12-04	9	$55 sales
Shanghai and Hongkong Dyeing and Cleaning Co., Ld.	1903	$60,000	1,200	$50	$50	none	*Dr.* $5,537	31-8-04	None	—	—	$50
Shanghai Gas Co., Ld.	1903	T800,000	16,000	T50	T50	*q* T125,000 T108,172	T7,548	31-12-03	Interim of T3½ for '04	29-7-04	8	T105 sales
Shanghai Horse Bazaar Co., Ld.	1904	T270,000	5,400	T50	T50	T45,000	T10,247	31-12-03	T5 for 1903	8-4-04	5¾	T88 sales
Shanghai Pulp and Paper Co., Ld.	—	T450,000	4,500	T100	T100	T10,000	T3,288	31-12-03	Interim of T6 for '04	20-7-04	7½	T155 sales
Shanghai Waterworks Co., Ld.	1881	£144,000	7,200	£20	£20	T140,000	T7.369	31-12-03	Interim of 15s. for '04	25-7-04	6	T400
Singapore Dispensary, Ld	1891	$30,000	600	$50	$50	$19,000	$800	31-7-03	$5 for year ended 31-7-03	11-11-03	6	$80
South China Morning Post, Ld.	1903	$150,000	6,000	$25	$25	none	*Dr.* $39,020	29-2-04	None	—	—	$22 buyers
Steam Laundry Co., Ld.	1902	$75,000	5,000 10,000	$5 $5	$5 $3	none	$3,644	31-5-04	60 cents for year ended 31-5-04 First year	2-8-04 —	8½ —	$7 $4 buyers
Straits Ice Company, Ld.	1884	$200,000	2,000	$100	$100	$45,000	—	—	$7½ for second half year '03	...-2-04	9¼	$160 sales
Straits Trading Co., Ld.	1887	$2,500,000	250,000	$10	$10	$650,000	$83,405	30-9-03	$1 dividend and 25 cents bonus for half year ended 31-3-04.	...-6-04	6½	$39 buyers
Tientsin Native City Waterworks Co., Ld.	1902	T294,100	2,941	T100	T100	none	T413	31-12-03	T2 for half year	9-3-04	—	T. T110
Tientsin Waterworks Co., Ld.	1901	T. T200,000	2,000	T. T100	T. T100	T15,259	T2,211	30-4-04	Final of T4 making T8 for '03/4	20-6-04	6¼	T. T130
United Asbestos Oriental Agency, Ld. Do. do. (Founders')	1896	$100,000	9,900 100	$10 $10	$4 $10	$20,000	$480	31-5-04	90 cents $29.70 } for year ended 31-5-04	6-8-04	9¼ 16¾	$9½ buyers $180 buyers
Watkins, Limited	1899	$100,000	10,000	$10	$10	*e* $4,802	$1,042	31-12-03	$1 for 1903	28-3-04	11	$9 sellers
William Powell, Ld.	1901	$120,000	12,000	$10	$10	*e* $3,000	$588	30-6-04	Final of 70 cts. making $1.20 for 03/4	28-9-04	9½	$12½ sales

LOANS AND DEBENTURES	AGENTS FOR THE LOAN	AMOUNT OF LOAN	PAR VALUE	OUT-STAND'G BONDS	WHEN PAYABLE.	CLOSING QUOTATIONS
Chinese Government, 7 per cent. Silver Loan 1886 E.	H. K. & S. Bk. Cor.	T767,200	T250	2022	Mar. 31st & Sept. 30th each year until Mar. 31st, 1917.	par. } Plus accrued interest
Hongkong Hotel Co., Ld., 6% Mortgage Debentures of 1899‡		$500,000	$500	§ all	Half yearly, June 30th and December 31st	par.
Chinese Engineering & Mining Co., Ltd., 6 per cent Debentures of 1902†	The Company.	£500,000	¶	£490,000	Half yearly, January 1st and July 1st	par.

a Amortisation Fund.
b Building Reserve Account.
c Capital Reserve Fund.
d Depreciation and Insurance Fund.
e Equalization of Dividend Fund.
f Exchange and Investment Fluctuation Account.
g Gold Reserve Fund
h Exchange Reserve Account.
i Insurance Fund.
j Reinsurance Fund.
k Contingencies Account

l Legal Reserve Fund.
m Electric Light Installation Fund.
n Sinking Fund.
o
p Authorized capital $2,000,000.
q Depreciation and Repair Fund.
r Repairs and Renewals Account.
s Silver Reserve Fund.
t
u Underwriting Suspense Account.
v Special Works Fund.

w
x Extra Reserve Fund.
y
z 75,000 owned by the Company.
1 5,725 shares unissued.
2 First issue of 60,000 of which 10,411 unallotted.
3 785 shares unissued.
4 7,600 shares unissued.
5 1,616 shares unallotted.
6 842 shares unallotted.
7 Only 13,000 shares issued.

8 14,000 shares unissued.
9 1,166 shares unissued.
* Based on last year's dividend.

§ 373 held by the Company.
¶ In certificates of £20 and £100
‡ Redeemable in 10 years, or at option of Company the Company giving 6 months' notice.
† Redeemable at par at rate of £10,000 per annum from 31st December, 1903, to December, 1952.
Dr. Deficit.

SINGAPORE SHARE QUOTATIONS.

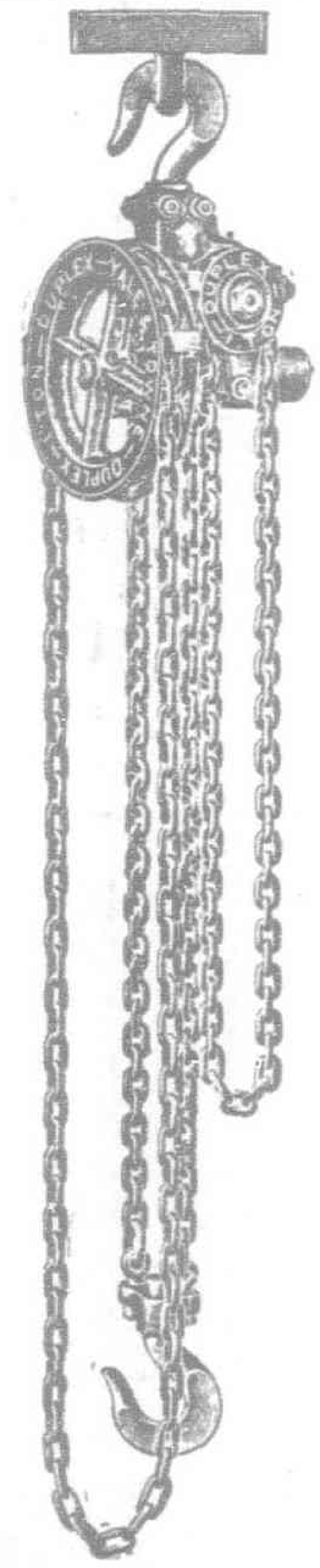
NAME	DATE OF FOR-MATION	CAPITAL	CAPITAL PAID UP	NO. OF SHARES	ISSUE VALUE	PAID UP	RESERVE	LAST DIVIDEND	SINCE LAST MAIL		CLOSING QUOTATIONS
									HIGHEST	LOWEST	
Mining.									$	$	$
Bersawah Gold Mining Co., Ld.	1900	$175,000	115,000	13,500 [1]	10	7.50	....	....	....	....	13 sales
" " " " *Deferred*				4,000	10	10	....	....	....	....	8 buyers
Bruseh Hydraulic Tin Mining Co., Ld.	1901	600,000	600,000	60,000	10	10	....	....	....	....	3.50 sellers
Kadana Gold Mining Co., Ld.	1901	300,000	220,000	20.000	10	10	....	....	....	....	10 nominal
" " " " *Pref.*				10,000	10	6	....	....	....	....	8 "
Kechau Goldfields, Ld. *Fully paid*	1902	£30,000	£16,175	6.207	1	1	....	....	....	....	8 00 sellers
" " " *Contrib.*				10,493 [2]	1	19/-	....	....	....	....	8 50 sellers
Pahang Corporation Ld.	1889	£250,000	244,306	244,306	1	1	20,000	3 per cent for year ending 30 6-02	....	....	3.75 sellers
Pahang Kabang Ld.	1890	375,000	366,000	360.000	1	19/6	....	....	1.10	1.10	1.00 buyers
" " " *Pref.*				15,000	1	1	....	....	....	....	...... nom.
Queensland Raub G. M. Co., Ld. *Fully paid*	1901	£146,700	100,866	36,700	1	1	....	....	....	....	...... nom.
" " " " *Contrib*				110,000	1	11/8	....	....	....	....	0.30 sellers
Raub Aust. Gold Ming. Co., Ld. *Fully paid*	1892	200,000	191,250	50,000	1	1	4,873	1s. paid January, '01	....	....	4.00 nom.
" " " " *Contrib.*				150,000	1	18/10	....	1s. " " "	....	....	3.75 sales
Redjang Lebong Mining Co.	1898	f.2,000,000	1,800,000	20,000 [3]	100	100	....	20 per cent for year ending 31-12-03	....	....	240 buyers
Royal Johore Tin Mining Co., Ld.	1900	$220,000	220 000	22,000	10	10	....	5 " for year ending 15-2-04	....	....	3.25 sellers
Sipiau Tin Co., Ld.	1899	230,000	230,000	23,000	10	10	8,000	5 " for ½ year ending 30-6-03	....	....	3.75 sellers
South Raub Gold Ming. Synd. Ld.	1898	100,000	100,000	1,000	100	100	....	....	....	....	10 nom.
The Belat Tin Mining Co., Ld.	1903	300,000	300,000	30,000	10	10	....	....	....	....	7.75 sellers
Tronoh Mines, Ld.	1902	£160,000	149.185	160,000 [5]	1	1	....	2s. paid Oct, '04	....	....	21.00 buyers
Duff Development Co., Ld.	1903	£400,000	£350,000	400,000 [6]	1	1	....	....	....	....	12 nom.
General.											
Fraser & Neave, Ld.	1898	225,000	225,000	4,500	50	50	112,500	10 per cent and 5 per cent bonus for '03	102.00	101.00	101 sellers
H'kong and Shanghai Banking Corporation	1865	10,000,000	10,000,000	80,000	125	125	10,000,000 [9] 6,500,000 250,000 [10]	30s. div. and 10s. bonus at 1s. 8⅞= $22.99.4 per share for ½ year ending 31-12 03	....	....	695 ....
Howarth Erskine, Ld.	1901	1,200,000	1,200,000	12,000	100	100	140,000	10 & 5 p. ct. bon. for yr. end 30-6-40	....	....	205 sales
Maynard & Co., Ld.	1901	34,000	34,000	3,400	10	10	....	20 per cent for year ending 31-10-04	....	....	25 sellers
Riley, Hargreaves & Co., Ld.	1899	875,000	875,000	6,000	100	100	150,000	10 p. ct. and 2½ p. ct. bon. for year '03			190 sales
" " " 7% Pref.				2,750	100	100	....	7 p. ct. for year 1903	....	....	112 buyers
Singapore Cold Storage Co., Ld. *Fully paid*	1903	600,000	240,000	25,000	10	10	....	....	....	....	9.50 sellers
Singapore Dispensary Ld.	1891	30,000	30,000	600	50	50	19.000	12½ per cent for year ending 31-7-04	....	....	75 sellers
Straits Ice Co., Ld.	1884	200,000	200 000	2,000	100	100	45,000	7½ " for ½ year ending 31-12-03	....	....	145 sellers
Straits Steam Ship Co., Ld.	1890	500,000	421,500	5,000 [7]	100	100	400,000 169,228 [11]	5 per cent for ½ year ending 31-12-03	....		140 sellers
Straits Trading Co., Ld.	1887	3,000,000	2,500,000	300,000 [8]	10	10	700,000 1,021,395 [12]	10 p. ct. & 35 cts. bon. ½ yr. end 31-9-04	39.25	38.75	39.25 sales
Tanjong Pagar Dock Co., Ld.	1864	3,700,000	3,700,000	37,000	100	100	1,950,000	$6 for half year ending 30-6-04	....		350 sales
Debentures. $											
Howarth Erskine Ld. 7 per cent ... 250,000	....	....	....	....	....	....	....	....	....	....	3 per cent prem.
Singapore Municipal 6 " ... 400,000	....	....	....	....	....	....	....	....	....	....	... " nominal
" " 5 " ... 1,878,000	....	....	....	....	....	....	....	....	....	....	1 " prem. buyers
" " 4 " ... 655.500	....	....	....	....	....	....	....	....	....	....	2 " dis. nominal
Riley Hargreaves & Co., Ld. 6 p. cent 225,000	....	....	....	....	....	....	....	....	....	....	2 " prem. buyers
Tanjong Pagar Dock Co., Ld. 6 " 250,000	....	....	....	....	....	....	....	....	....	....	2 " prem. buyers
" " " " 5 " 1,365,500	....	....	....	....	....	....	....	....	....	....	1 " prem. buyers

---

[1] 3,500 unissued.
[2] 13,300 "
[3] 2,000 "
[4] 35,000 unissued.
[5] 10,815 "
[6] 50,000 "
[7] 785 unissued.
[8] 50.000 "
[9] Special Gold Reserve Fund.
[10] Insurance Fund.
[11] Sundry Reserves.
[12] Sundry Reserves.

FRASER & CO., SHAREBROKERS.

THE HANDY DUPLEX



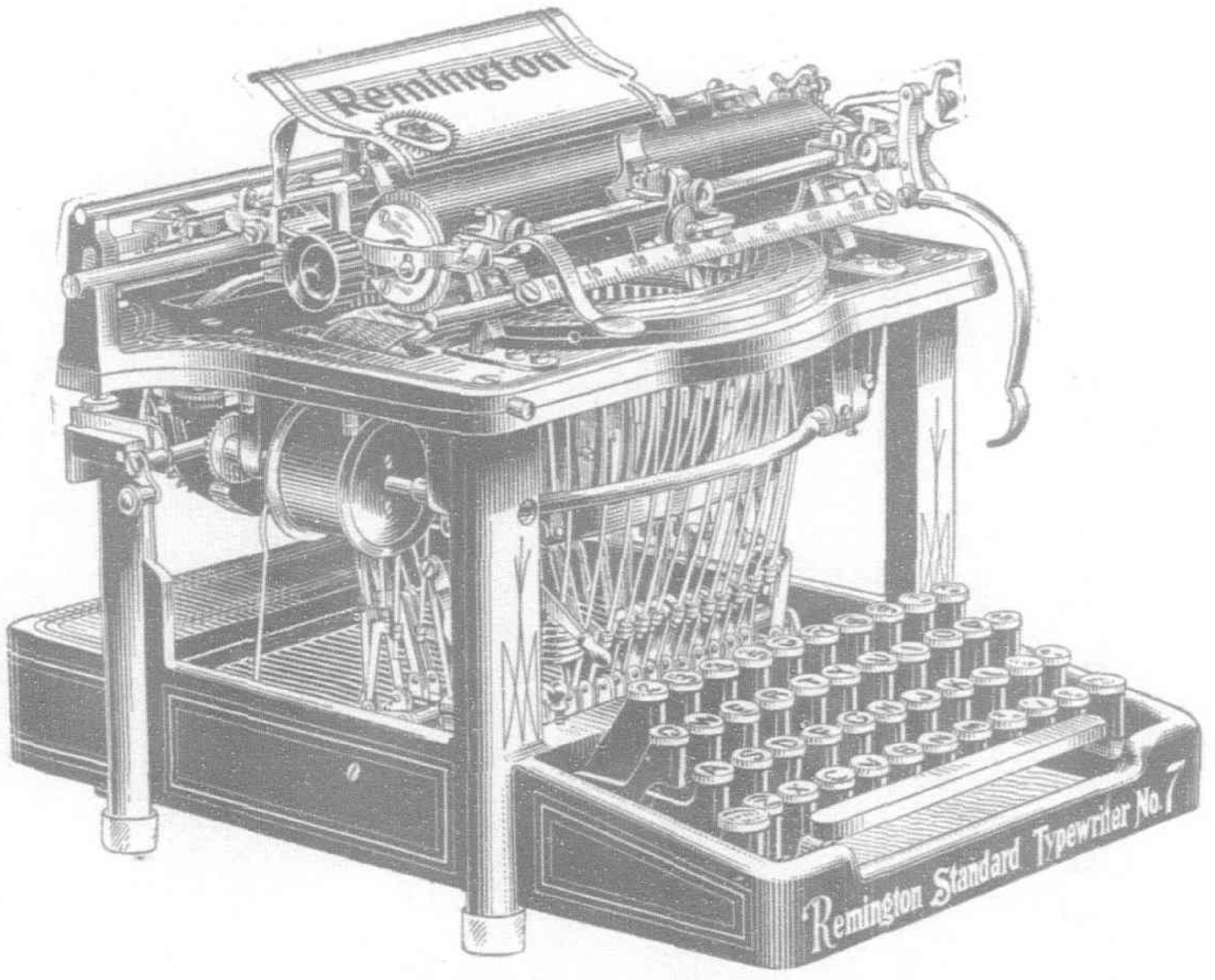
The Yale and Towne "Duplex" Block is made of the same quality of material and with the same care as the famous "Triplex." It is 25 per cent more powerful than any other screw hoist made, and gives great efficiency with ease of action.

The "Duplex" is light enough to be carried about easily, either in the mine or shops. It is so compact that it will work in places where the headroom is very cramped.

For lifting timbers, tubing or machinery, the "Duplex" is specially convenient; where loads are handled often the "Triplex" will be found the best, because of its higher efficiency, which saves the men.

THE YALE AND TOWNE MFG. CO.
9-11-13 Murray Street, New York
F. L. STRONG, Agent, Manila

THE "REMINGTON" LEADS
BECAUSE IT IS THE BEST



THE REMINGTON TYPEWRITER CO.
NEW YORK
ORIENTAL AGENTS
E. C. McCULLOUGH & CO. MANILA

THE NEW ORIENTE HOTEL
Corner Calles Real and Magallanes, Walled City
...MANILA, PHILIPPINE ISLANDS...

This Popular House was opened in 1904 and is strictly First-Class in all its appointments. Within ten minutes' walk of the Luneta Beach. Rooms are Large, Airy, and Elegantly Furnished, dining room on the ground floor, Cuisine the Best in the City. Special Rates given to Tourist Parties on application :

Under the Management and Personal Supervision of

AH GONG & CO.,
(FORMERLY OF THE FAMOUS OLD HOTEL ORIENTE)

FRED WILSON & COMPANY
75 URBIZTONDO | ENGINEERS | BINONDO, MANILA

SUGAR, RICE AND OIL MACHINERY

STATIONARY AND PORTABLE BOILERS, TRACTION ENGINES,
ROAD-MAKING MACHINERY, ELECTRICAL MACHINERY, ETC.

ENGINEERING SUPPLIES

American Hardware and Plumbing Company

99 PLAZA SANTA CRUZ
MANILA

Complete Lines of Hardware, Valves, Pipes, Fittings, Packing and Plumbing Supplies

ALWAYS IN STOCK

J. P. WILSON

ENGINEER AND FOUNDER

Steam Launches, Agricultural Implements and Machinery

BOILER, MACHINE SHOP AND FOUNDRY

ALL CLASSES OF MACHINERY REPAIRED

Barraca No. 11, Binondo, Manila

ALBERT J. G. DENNEY

MINING ENGINEER,
TIENTSIN, NORTH CHINA

SURVEYS OF MINERAL CLAIMS, TOWNSITES, COAL AND TIMBER CLAIMS, LAND PURCHASES, ETC.

REPORTS ON MINES AND MINERAL CLAIMS. GOLD MINES A SPECIALTY. EXPLORATION, SURVEYS, ETC.

Cable Address:
DENNEY, TIENTSIN

Codes: Bedford McNeil,
Moreing & Neal: A B C, New Edition.

FINDLAY & CO., MANILA.

GENERAL MERCHANTS,
ENGINEERS AND CONTRACTORS
IMPORTERS AND EXPORTERS.

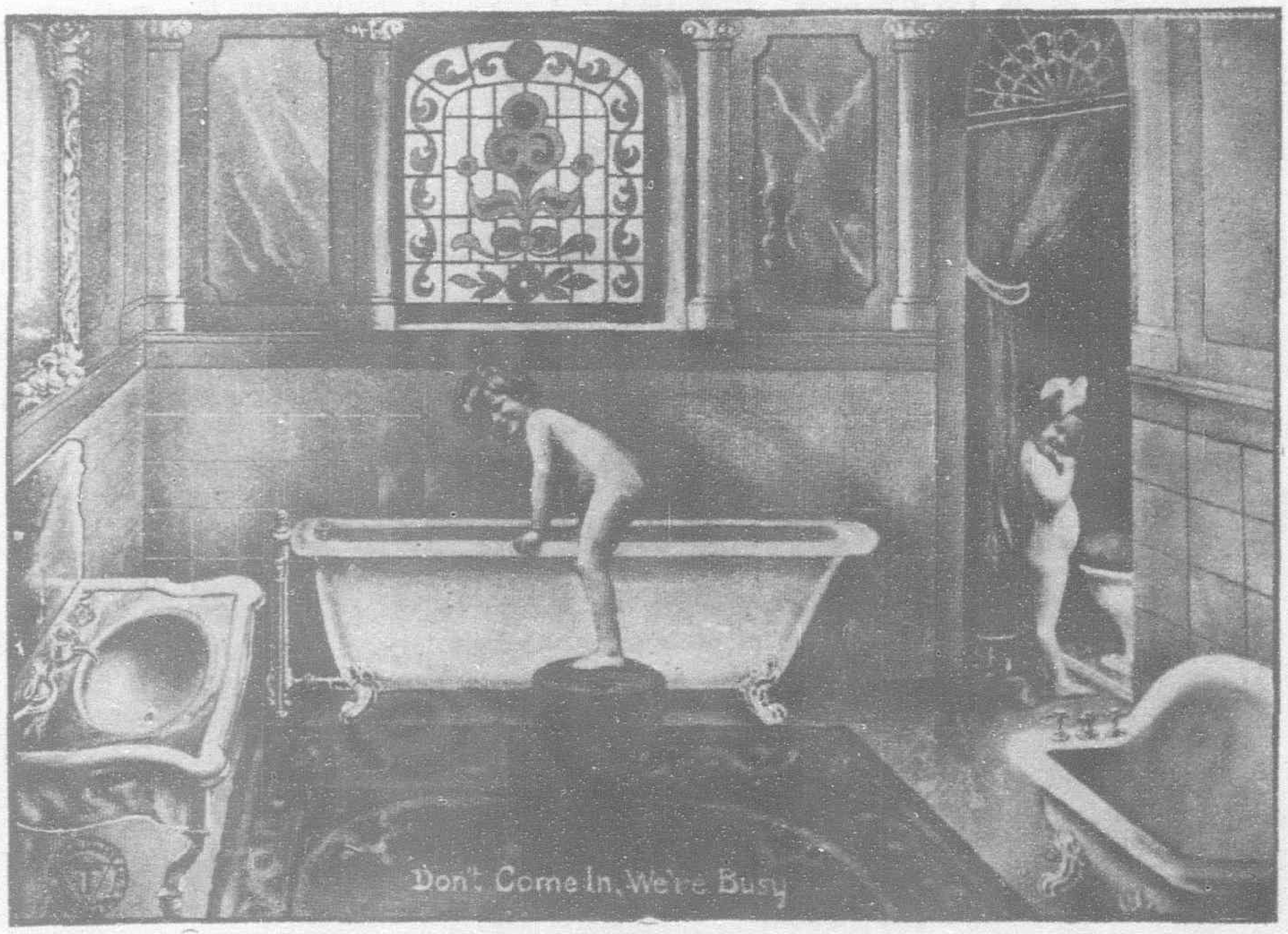
Fine Goods and all kinds of Hardware and Machinery, Cements, Australian Hardwoods and California Lumber

Milner's Safes, Perry's Safes, Nestle's Milk, McOnie & Harvey's Sugar Machinery, The Forcite Powder Co's Explosives, White Bros. Cement

THE NORTHERN ASSURANCE COMPANY.
NORTH BRITISH AND MERCANTILE INSURANCE COMPANY.
THE PALATINE INSURANCE COMPANY, LIMITED.
THE LONDON ASSURANCE CORPORATION.

GEORGE H. TAY CO.

SAN FRANCISCO — SEATTLE — LOS ANGELES — MANILA


Don't Come In, We're Busy

MODERN AMERICAN PLUMBING

COMPLETE SEWER AND WATER SYSTEMS

PIPE, VALVES, FITTINGS, PUMPS, WINDMILLS, ETC.

MOST COMPLETE SHOWROOM IN THE FAR EAST

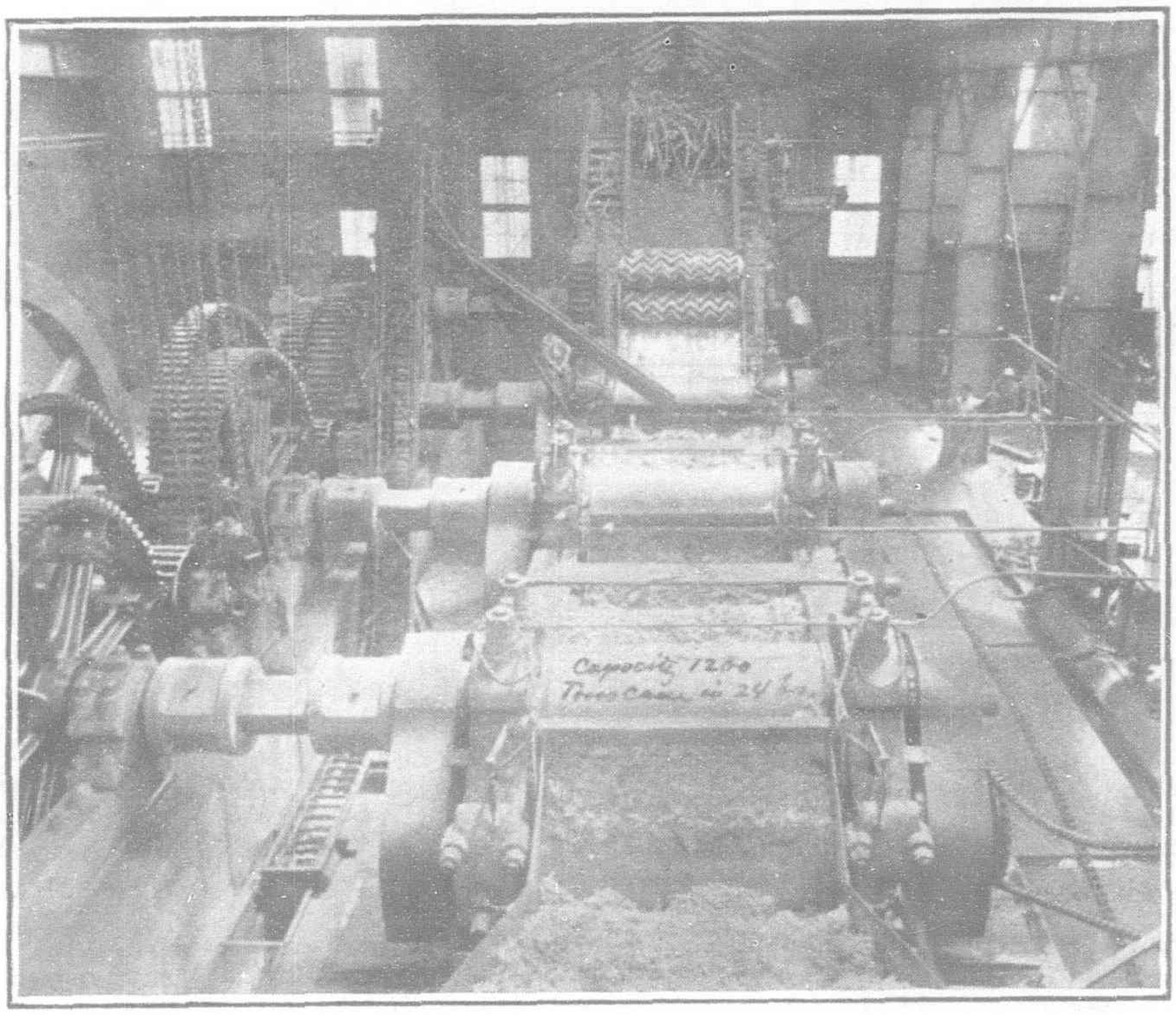
Correspondence Solicited
Estimates Furnished

CHAS. W. McDONALD, Manager
MANILA

30-40 PLAZA GOITI (McCULLOUGH BUILDING)

THE HONOLULU IRON WORKS CO.

HONOLULU, T. H.



NINE-ROLLER MILL AND CRUSHER; CAPACITY, 1200 TONS OF CANE IN 24 HOURS.

ENGINEERS, FOUNDERS AND MACHINISTS : : :

DESIGNERS AND BUILDERS OF COMPLETE SUGAR PLANTS : :

THREE, SIX AND NINE ROLLER MILLS AND CRUSHERS : : : DEFECATORS, MULTIPLE : : EFFECTS, VACUUM PANS AND PUMPS, CENTRIFUGALS : : : GREEN BAGASSE FURNACES ETC., ETC. : : : : : : : :

PARTIAL LIST OF FACTORIES DESIGNED AND ERECTED

Puunene Mill: Capacity	3500	tons of cane in 24 hrs.
Ewa Plantation	2200	" " " " " "
Oahu Sugar Co.	1200	" " " " " "
Waialua Sugar Co.	1100	" " " " " "
Francisco Sugar Com. (Cuba)	1000	" " " " " "
Olaa Sugar Co.	1200	" " " " " "

CORRESPONDENCE SOLICITED

C. B. RIPLEY, AGENT.
PARIS BUILDING
MANILA, P. I.

The **B. W. Cadwallader Co.**

CONTRACTORS AND BUILDERS

Wholesale and Retail Dealers in Oregon Pine, California Redwood, and Native Lumber

OWNERS AND OPERATORS OF EXTENSIVE

Saw and Planing Mills

SASH, DOORS, INTERIOR TRIM AND OFFICE FURNITURE MADE TO ORDER

Modern Cottages Built

AT REASONABLE PRICES

General Construction Work

OF ALL KINDS

Main Office and Mill
51 Tanduay
Telephone, 363

MANILA

Yard Office
299 San Miguel
Telephone, 364

Engineers are the World's Pioneers and Civilizers

ENGINEERING NEWS, 220 Broadway, New York, has been for thirty years the true and tried companion of these men, **THE REAL NATION BUILDERS.** No class of men is so highly respected as the engineer and contractor, who push and plant civilization through the wilds of the wildest countries. These men must keep up with the methods of their fellow-engineers in other sections of the world.

This can only be done by reading a paper that has made a practice of furnishing this kind of information, and is broad-minded in spirit and in keeping with that of the engineers and contractors.

ENGINEERING NEWS,
19th FLOOR, 220 BROADWAY, NEW YORK.

ENGINEERING NEWS has always been first in keeping the world in touch with engineering progress. If you have never seen a copy, send for a sample, enclosing a stamp of your country for postage. Subscription in the United States and Possessions, Mexico and Canada, $1.00 (U. S. Cy.) for 10 weeks; $5.00 for one year. To foreign countries add 5 cents for each week, to cover postage.

ADVERTISE FOR TENDERS IN ENGINEERING NEWS, and always keep us posted regarding new work.

When in the market for supplies, write us.

Engineering News.

LOUIS T. GRANT,
GEN. MANAGER.

W. A. RAPPLE,
SUPERINTENDENT.

GRANT & CO., LTD.,
CONSULTING AND CONTRACTING ENGINEERS

SOLE AGENTS FOR THE PHILIPPINE ISLANDS, GENERAL ELECTRIC CO.
SCHENECTADY, N. Y.

Electric R. R., Light, and Power Plants. Steam and Hydraulic Installations. Isolated Lighting Plants a Specialty. Motors, Telephones, and Wiring. A full line of Fans and Electric Light and House Fixtures on Hand. Estimates Furnished.

P. O. Box
759.

OFFICE AND STORE:
68 DULUMBAYAN.
MANILA, P. I.

BRYAN, LANDON COMPANY

IF YOU ARE IN THE DARK
AS TO WHAT YOU REQUIRE IN THE MECHANICAL LINE,
SEND US WORD, AND WE WILL PUT
YOU RIGHT

WE ARE
MECHANICAL, ELECTRICAL ENGINEERS, AND GENERAL CONTRACTORS

ESTIMATES CHEERFULLY FURNISHED

for the installation of all kinds of Electrical, Steam, Water power and Refrigerating plants—Mining Machinery, Stamp Mills—Steam, Gas, Gasoline, Kerosene and Alcohol Engines—Steam and Water Turbines—Telephone Exchanges, and all kinds of Electrical Fixtures.

Agents for BULLOCK ELECTRIC MANUFACTURING COMPANY

Cable Address:
"HOOPTON"

California-Manila Lumber Commercial Company
Manila, P. I.

The Biggest Stock of American Lumber and Largest Assortment of American Hardware in the Far East

RAILROAD TIES

Pine, Redwood, Spruce, Hemlock and Philippine Hardwoods: Doors, Sashes and Millwork. Launches and Lorchas
For Sale or Hire

ORIENTAL AGENTS FOR
HERCULES GASOLINE ENGINES: GOODYEAR RUBBER TIRED WHEELS

CARMICHAEL & CLARKE
5 Queen's Building ENGINEERS Hongkong
SOLE FAR EASTERN AGENTS FOR
SMOOTH-ON IRON CEMENTS
"SMOOTH-ON" WILL STOP ALL LEAKS

"SMOOTH-ON" iron cement will reduce your Boiler-maker's bill; it is easily applied and once applied it becomes part of the boiler, as it metalizes with the object to which it is applied.

"SMOOTH-ON" saves time, money, and worry to Engineers, and best of all saves your boiler. Once tried, you will find it is worth its weight in gold.

"SMOOTH-ON" iron cement No. 1 is quick drying.
"SMOOTH-ON" iron cement No. 2 is slow drying.
"SMOOTH-ON ELASTIC CEMENT."
"SMOOTH-ON CASTINGS" for flaws in castings.

Telegraphic Address: SALWEEN

Salween House
MANDALAY

Board and Lodging by day, week or month. Liberal Table. Splendid testimonials.

Cable Address:
FARNHAM, SHANGHAI

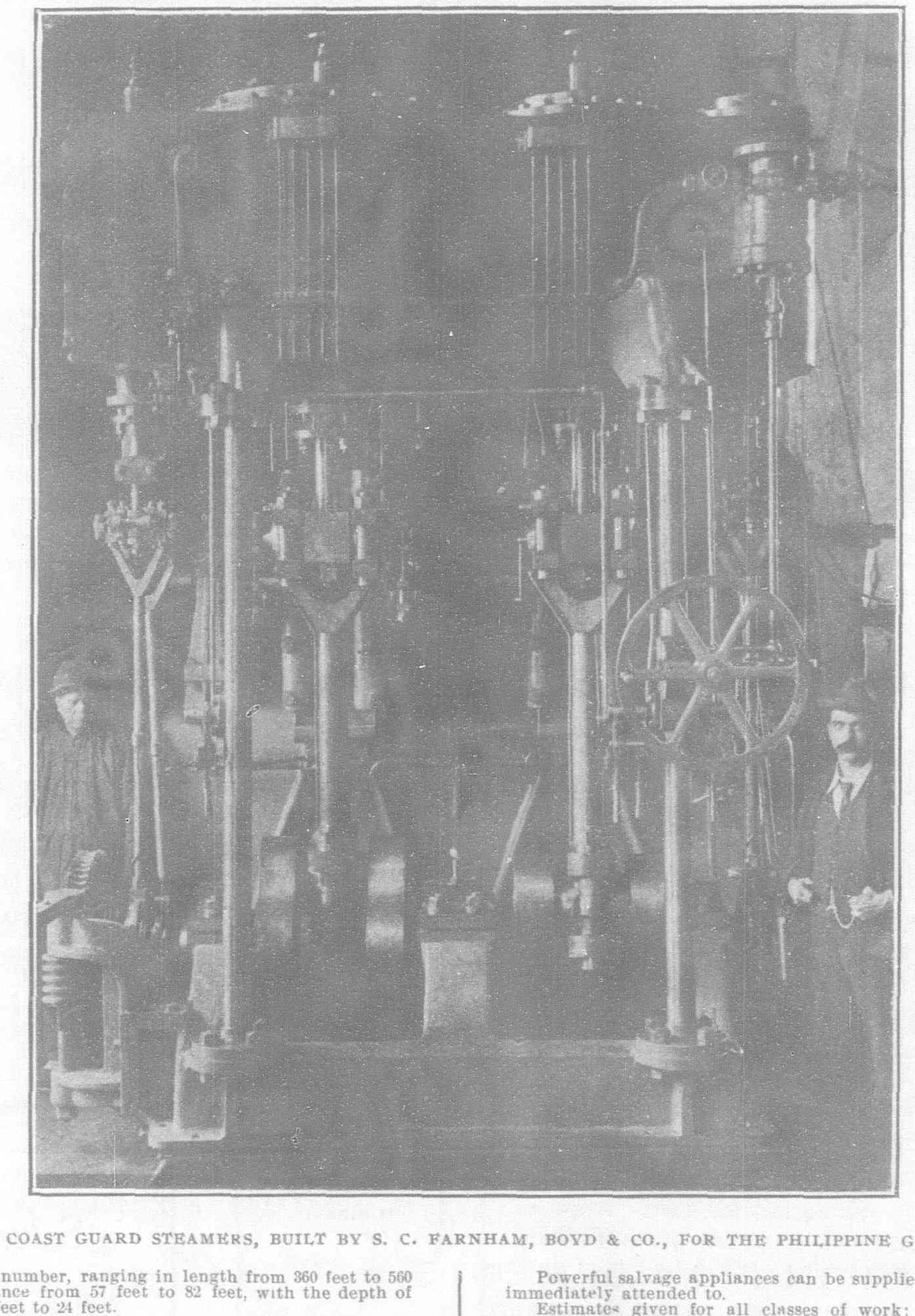
Codes Used:
A I., A B C (4th & 5th Editions)
Watkin's, Scott's, Western Union, and Engineering.

S. C. FARNHAM, BOYD & CO., LTD.

ENGINEERS, FOUNDERS, BOILERMAKERS
SHIPBUILDERS, AND ELECTRICIANS : : :

DOCK
OWNERS

SHANGHAI
CHINA



ENGINES OF COAST GUARD STEAMERS, BUILT BY S. C. FARNHAM, BOYD & CO., FOR THE PHILIPPINE GOVERNMENT.

The Docks are five in number, ranging in length from 360 feet to 560 feet, and breadth of entrance from 57 feet to 82 feet, with the depth of water on the sill from 16 feet to 24 feet.

The Dock charges are very moderate.

The Water Frontage is about 1½ miles in length. Wharves and Pontoons are arranged where steamers can moor during repairs; and slips for hauling up small vessels are provided. Sheer legs capable of lifting 65 tons are placed at the various Docks.

The extensive Shipbuilding yards and workshops are provided with the latest improvements in tools, traveling cranes of 70 tons' capacity, hydraulic and pneumatic machinery.

Lit up by Electric light with railway lines through workshops and yards.

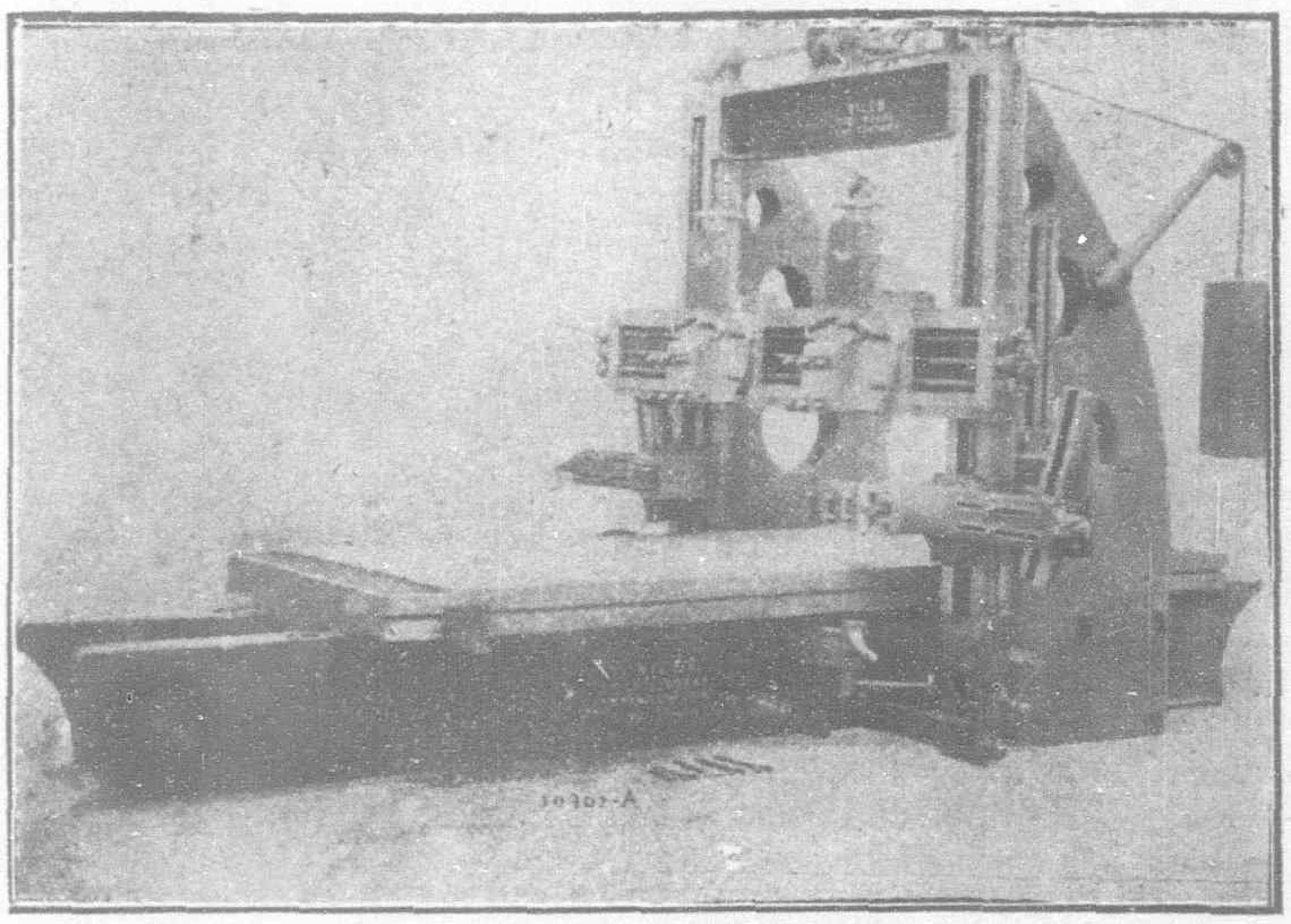
Powerful salvage appliances can be supplied at short notice. Enquiries immediately attended to.

Estimates given for all classes of work; Coast Steamers, Side and Stern-Wheelers, Tugboats, Launches, Steam Barges, Dredgers, Floating Cranes, and Lighters a speciality.

Every description of repairs and renewal work undertaken and expeditiously executed.

Land and Marine Engines and Boilers, Centrifugal, Mining, and other pumping machinery always in stock or in progress, also power driven Machine Tools. Engineer's Hand Tools, Steam, Gas, Oil, and Electric machinery and engineering accessories generally.

CORRESPONDENCE INVITED



FRANK L. STRONG, M.E.

42" PLANER, SUPPLIED TO INSULAR COAST GUARD SHOPS

ENGINEER
AND
MANUFACTURER'S AGENT
FOR
HIGH GRADE AMERICAN
MACHINERY
AND
SUPPLIES

SPECIFICATIONS FURNISHED

70 CALLE ROSARIO
MANILA, P. I.
P. O. Box 772. Cable "STRONG"

AMERICAN-ASIATIC STEAMSHIP CO.

NO. 16 BEAVER ST., NEW YORK.

REGULAR MONTHLY SAILINGS, VIA SUEZ CANAL, DIRECT TO ADEN, MANILA, STRAITS SETTLEMENTS, CHINA, AND JAPAN.

Through Bills of Lading issued and rates quoted to all points in the Far East. Insurance effected at lowest rates. Shipments from Interior points in the United States given careful attention. For rates of freight and full particulars, apply to the company.

General Eastern Agents:
SHEWAN, TOMES & CO.,
Hongkong.

Manila Agents:
CASTLE BROS-WOLF & SONS,
18-24 Plaza Moraga.

CASTLE BROTHERS-WOLF & SONS

No. 18-24 Plaza del P. Moraga - - - - - - - - - - - - - MANILA, P. I.

MAIN OFFICE: 321 DAVIS ST., SAN FRANCISCO.

SHIPPING AND COMMISSION MERCHANTS

IMPORTERS AND EXPORTERS

AGENTS IN MANILA FOR

STEAMSHIP DEPARTMENT:
PACIFIC MAIL S. S. CO., OCCIDENTAL and ORIENTAL S. S. CO.,
TOYO KISEN KAISHA,
AMERICAN-ASIATIC S. S. CO.,
APCAR Line of Seamers.

INSURANCE DEPARTMENT:
FIREMAN'S FUND INSURANCE CO. OF SAN FRANCISCO.
CONTINENTAL INSURANCE CO.
"AMERICAN LLOYDS."

IMPORT DEPARTMENT:
AMERICAN TRADING CO., New York, China, and Japan.
ARMOUR & CO., Chicago.
H. J. HEINZ & CO., Pittsburgh.

Hongkong and Shanghai Banking Corporation

DEPOSITORY OF THE GOVERNMENT OF THE PHILIPPINE ISLANDS

Paid up Capital	**$10,000,000**	**Silver Reserve Fund**	**$ 7,000,000**
Sterling Reserve Fund	**$10,000,000**	**Reserve Liability of Prop'rs.**	**$10,000,000**

COURT OF DIRECTORS

Chairman, A. J. RAYMOND, Deputy Chairman, H. E. TOMKINS, Hon. W. J. GRESSON, E. GOETZ, A. HAUPT, E. SHELLIM, H. SCHUBART, Hon. R. SHEWAN, N. A. SIEBS, H. W. SLADE, E. S. WHEALLER

BRANCHES AND AGENCIES

Hongkong
Shanghai
Yokohama
London
Bombay
Calcutta
Foochow
Kobe
Saigon
Hankow
Amoy
Manila
San Francisco
New York
Singapore
Lyons
Tientsin
Pekin
Iloilo
Penang
Batavia
Bangkok
Hamburg
Nagasaki
Rangoon
Colombo
Sourabaya

CORRESPONDENTS—In Cebu, Samar and Leyte: WARNER, BARNES & CO., LTD.
LONDON OFFICE—31 Lombard St.
LONDON BANKERS—London & County Banking Co., Ltd.

Interest Allowed on Fixed Deposits at Rates which may be Learned on Application. Credits Granted on Approved Securities, and Every Description of Banking and Exchange Business Transacted. Drafts Granted on London and the Chief Commercial Places in Europe, India, Australia, America, China and Japan.

J. R. M. SMITH, Chief-Manager - - - HONGKONG ~ H. D. C. JONES, Manager - - - - - MANILA

WADE GARDNER, Agent, 50 Wall Street, New York.

INTERNATIONAL BANKING CORPORATION

1 WALL STREET, NEW YORK Cable Address: "INBANCOR"

CAPITAL AND SURPLUS, $7,894,400.00

WILLIAM L. MOYER, President. JAMES S. FEARON, Vice-President, JOHN B. LEE, General Manager. ALEXANDER & GREEN, Counsel

BRANCHES:

LONDON
WASHINGTON, D.C.
SAN FRANCISCO
CITY OF MEXICO
PANAMA
YOKOHAMA
KOBE
SHANGHAI
HONGKONG
CANTON
MANILA
CEBU
SINGAPORE
CALCUTTA
BOMBAY

AGENCIES:

AMOY
ANPING
BAKAN
BANGKOK
BATAVIA
COLOMBO
HANKOW
MOJI
MADRAS
PENANG
RANGOON
SAMARANG
SOURABAYA
SAIGON
TIENTSIN
TAMSUI
ILOILO

CORRESPONDENTS IN ALL PRINCIPAL CITIES OF THE WORLD.

Fiscal Agent for the Collection of the Chinese Indemnity

Fiscal Agents for the United States in China and the Philippine Islands.

Designated Depository for the Funds of the Government of the Philippine Islands.

GENERAL FOREIGN BUSINESS TRANSACTED.

Issue Commercial Travellers' Letters of Credit. Buy and Sell Bills of Exchange and Cable Transfers.